THE AMERICAN
JOURNAL OF PHARMACY.

AUGUST, 1885.

OLEATE OF MANGANESE.

By C. E. Kreyssler, Ph.G.

Drs. Martin and McArthur having suggested the use of Oleate of Manganese as a menstrual stimulant, and as a remedy in functional amenorrhœa, menorrhagia and metrorrhagia, and not being able to obtain the same, requested me to make an attempt to prepare it, which I did, in the following manner, by acting on a solution of the sulphate of manganese, with a solution of sodium oleate: The powdered and dry Castile soap being considered a sufficiently pure sodium oleate, was used in making the solution; this solution was then gradually, and with constant stirring, aded to the solution of the sulphate of manganese, at once precipitating a granular appearing substance, being the oleate of manganese, which, on being slightly heated, suddenly changed to a sticky mass, having the consistency of putty, and this being washed several times with warm distilled water, to free it from the sulphate of soda, resulted in a hard substance having a light gray, slightly pinkish color, of a sweet musty taste, and peculiar odor, being sparingly soluble in alcohol, but soluble in ether, chloroform, olive oil and oleic acid.

To test this oleate a portion of it was oxidized on a platinum foil, and a fragment of caustic potash and same quantity of chlorate of potassium added, and held in a blowpipe flame until the fused mixture had become dark green, or the color of manganate of potassium, and on adding water to this, and boiling for a short time, it produced the solution of permanganate of potash, having the usual purple color.

The method of applying this oleate is as follows: About one teaspoonful of the 20 per cent. solution of the oleate is applied to the abdomen of the patient, and absorption promoted by friction, produced by vigorous rubbing of the surface with the palm of the hand, or fingers, continuing the rubbing until absorbed; it may also be applied to the spine, or inner surface of the thighs.

Dr. Martin recommends the application of the same in amenorrhœa,

if possible, every night for a week preceding the expected menstrual period, or at the time the menstruation is due, and until it makes its appearance, and in menorrhagia or metrorrhagia in smaller quantities, every night until the desired effect is produced.

Permanganate of potash in pill form has been used for the same purposes, without any noticeable effect, and was very objectionable to many, on account of the liability to act as an irritant to the stomach. The binoxide of manganese has also been used, without effect, on account of its insolubility.

This oleate is highly recommended by Drs. Martin, McArthur and others, who have used it in their practice, and I would like to encourage others to give this valuable remedy a good and faithful trial.

CHICAGO, July 1, 1885.

ON THE INCOMPATIBILITY OF CHLORAL HYDRATE IN THE PRESENCE OF POTASSIUM BROMIDE AND ALCOHOL.

BY GEORGE F. H. MARKOE,

Professor of General and Pharmaceutical Chemistry in Massachusetts College of Pharmacy.[1]

In December, 1884, the writer had sent to him a bottle containing a mixture and a prescription, of which the following is an exact copy:

℞. Bromide potass.....
Chloral hydrate.....*āā* ʒiii
Tr. opii et camph.....
Syr. Zingiber.....*āā* ʒiss
M.
Sig. One or two teaspoonfuls in half a wineglass of water every 2 to 6 hours. For sleep.

The claim was made by the physician that the pharmacist who dispensed the mixture had made a mistake, and the matter was put into the writer's hands for investigation. The mixture, as received, consisted of two layers, a clear dark brown liquid, floating upon a light-colored dense liquid. The dark-colored supernatant liquid had an intensely strong taste, in which the characteristic taste of chloral pre-

[1] Read before the Massachusetts State Pharmaceutical Association, Pittsfield, Mass., June 4, 1885.

dominated, but it was modified by the presence of ginger, camphor and anise, all of which could be recognized. On shaking the two liquids together a somewhat turbid mixture resulted; on standing, the two layers formed again.

The prescription was then made up, with the result that the ingredients separated into two layers, apparently in the same way with the mixture sent for examination. The writer could discover no practical difference in the two samples, and therefore concluded that some decomposition had taken place.

Anhydrous chloral (Trichlor-aldehyde C_2HCl_3O) is a thin, oily liquid, which will combine with an equivalent quantity of water to form chloral hydrate C_2HCl_3O,H_2O.

Chloral also combines with an equivalent of alcohol to form Chloral alcoholate C_2HCl_3O,C_2H_6O. Chloral alcoholate forms white needle-shaped crystals, is much less soluble in water than chloral hydrate, has a more disagreeable taste and is harsher in its action upon the system. When chloral hydrate was introduced into the practice of medicine, the writer was one of the first to make it in this country, and incidentally prepared and studied chloral alcoholate; two or three physician friends made trials of it, but found, that while it acted as an hypnotic, it was more disagreeable to the taste and harsh in its action, leaving unpleasant secondary effects. Knowing that chloral hydrate is changed into the alcoholate by solution in alcohol, it occurred to the writer that a similar decomposition had taken place in the mixture in question, the alcohol being furnished by the paregoric elixir called for in the prescription.

The following experiments were then made with a view to prove the supposition:

Exp. 1.	Potassium bromide	60 grains.
	Chloral hydrate	60 grains.
	Water	6 fluidrachms.
	Syrup of ginger	6 fluidrachms.

These articles formed a perfect solution which did not separate on standing.

Exp. 2.	Potassium bromide	60 grains.
	Chloral hydrate	60 grains.
	Water	3 fluidrachms.
	Alcohol	3 fluidrachms.
	Syrup of ginger	6 fluidrachms.

In this experiment, it will be noted that the ingredients differ from the original prescription only in the substitution of diluted alcohol for the paregoric. After standing a short time this mixture separated into two layers, the upper layer being of a light straw color.

Exp. 3. This experiment was with the same ingredients used in No. 2, except that the alcohol was not added until after the mixture had been standing for an hour. No separation took place before the addition of the three fluidrachms of alcohol, but the separation occurred promptly after the addition of the alcohol. These experiments prove that the alcohol is the cause of the trouble, and the writer thinks that the chloral hydrate is changed into the less soluble chloral alcoholate.

In addition to the experiments which have been described numerous other ones were tried, which served to confirm the results of those named. The writer found that the addition of potassium bromide, sodium bromide, sodium chloride and magnesium sulphate to strong solutions of chloral hydrate together with the presence of alcohol determined a separation of the liquids into two layers. Ammonium chloride, ammonium bromide, potassium nitrate and calcium bromide did not disturb the same chloral solutions.

The practical lesson to be learned from this incompatible prescription, is that alcoholic preparations should not be prescribed with chloral hydrate, especially not in connection with the bromides of potassium and sodium, because if the solutions used are at all concentrated the chloral will separate as alcoholate, float on the surface, and a great risk will be incurred of giving a large overdose, the patient having received no caution with regard to the necessity of shaking the contents of the bottle before taking a dose.

DUNLAP'S DIARRHŒA MIXTURE.—

℞.	Tincture of opium		
	Tincture of camphor		
	Tincture of peppermint	aa	℥ ss
	Tincture of ginger		℥ iij
	Tincture of capsicum		
	Hoffman's anodyne	aa	℥ ss

M. Dose, a teaspoonful diluted with sweetened water, after each operation. This is especially good in cholera morbus.—*New. Eng. Med. Monthly*, April, 1885.

PHARMACEUTICAL PREPARATIONS OF THE MEXICAN PHARMACOPŒIA.

By the Editor.

(Continued from page 291.)

A large number of the formulas are identical or nearly so with those admitted into the French Codex, or published in Dorvault's l'Officine. In the following we select only such which differ materially from, or are not contained in the works named:

Café de Bellotas, Pulvis glandium quercus tostarum.—Acorns deprived of the rind are heated in a coffee roaster, until they become brittle and have lost 28 per cent. in weight, when they are ground in a coffee mill. The powder is tonic and astringent and is used like coffee, the infusion being made with 15 Gm. to 1 liter of water.

Cápsulas medicinales, Capsulæ medicatæ.—Directions are given for preparing the empty capsules and for filling these as well as the so-called pearls. The material suitable for capsules is prepared by dissolving white gelatin 30, Irish moss paste 60, and honey in water 100 parts. If necessary greater flexibility may be imparted to the mass by adding a little glycerin.

Cataplasma anodina, Cataplasma anodynum.—Powdered bread crumb 125 Gm., powdered saffron 2 Gm., yelk of eggs 2, milk sufficient.

Cataplasma con subacetato de plomo, Cataplasma cum Subacetate plumbico.—Bread crumbs 60, Goulard's extract 30.

Cataplasma emoliente, Cataplasma emolliens.—Ground flaxseed, powdered round-leaved mallow, equal parts; hot water sufficient.

Cataplasms of belladonna, conium, hyoscyamus, stramonium, etc., are made in the same manner.

Cataplasma refrigerante, Cataplasma refrigerans.—Mix barley meal 185 with powdered red saunders 15 and add gradually oil of rose petals (see p. 287) 30, and sufficient strong vinegar.

Cerato de Bell, Ceratum ex Bell.—Melt together white wax 100, spermaceti 50 and cold-pressed sesame oil 400.

Cerato de Galeno, Ceratum ex Galeno.—White wax 200, sesame oil 600, lard 200, distilled rose-water 400.

Cerato simple, Ceratum simplex.—Like the preceding, omitting the rose-water.

Cervezas medicinales and Cigarros medicinales are the Bières médicinales and Cigares medicinaux of French pharmacy.

Collodion morfinado, Collodium cum Chlorhydrate morphico.—Dissolve morphine hydrochlorate 1 in elastic collodion 30.

Crema fria, Ceratum cosmeticum anglicum.—White wax 30, sperm-aceti 60, cold-pressed sesame oil 215, rose-water 60, tincture of benzoin 15 Gm., attar of rose 6 drops.

Electuarium de Beleño opiado, Electuarium Hyoscymi opiatum.—Hyoscyamus seed 25, anise 25, fennel 25, castoreum 25, myrrh 25, Ceylon cinnamon 30, extract of opium 20, saffron 10; reduce to a very fine powder and incorporate with thick honey 1,000. Of this electuary 4 Gm. contain about 0·07 Gm. extract of opium.

Elixir de Jaborandi, Elixir de Pilocarpo pinnato.—Jaborandi 100, alcohol (60 per cent.) 600; macerate for 10 days, express, add simple syrup 400, and filter; strength 10 per cent.

Elixir de Coca del Perú is prepared in the same manner.

Emetina medicinal is the aqueous extract of the alcoholic extract of ipecacuanha.

Emplasto agglutinante, Emplastrum picis compositum.—Colophony 2,000, white copal 620, turpentine 250, sesame oil 150, white wax 120.

Emplasto de Belladona, Emplastrum belladonnæ.—Exhaust belladonna leaves 250 with a mixture of ether 1 part and alcohol (60 per cent.) 4 parts, evaporate and incorporate with lead plaster 120 and Burgundy pitch 15.

The plasters of conium, hyoscyamus, digitalis, stramonium and similar drugs are prepared in the same manner.

Emplasto Cera católica, Emplastrum Cera catholica.—Yellow wax 500, turpentine 250, white copal 500, powdered bdellium 40, powdered olibanum 40, balsam of Peru 40.

Emplasto de Cimbron de Castilla, Emplastrum Lavandulæ compositum.—White copal 1,000, Campeachy wax 1,000, tar 375, sesame oil 100, sweet gum (liquidambar) 180, powdered allspice 120, and the volatile oils of lavender 4, cinnamon 0·5, cloves 1, origanum 2, anise 2 and rosemary 2. Spread upon black paper, this plaster is known as *piel divina* (divine skin).

Emplasto de Cloral, Emplastrum cum Chloralo.—White wax and chloral hydrate, equal parts.

Emplasto confortativo de Vigo, Emplastrum catagmaticum ex Vigo.—Melt together lead plaster 3,250, Campeachy wax 500, and turpentine 250, and add the following in fine powder: olibanum, myrrh, sandarac, dragon's blood, red lead and Armenian bole, of each 120.

Emplasto de Estabillo de Puebla, Emplastrum ex Estabillo.—Melt lead plaster 1,600, Campeachy wax 180 and rosin 60, add soft galbanum 30, incorporate with the following in fine powder: ammoniac 30, olibanum 30, zinc oxide 30, dragon's blood 16, Armenian bole 15 and camphor 15, and mix with corrosive sublimate (dissolved in alcohol) 10, oil of rosemary 10 and oil of amber 10.

Especies amargas, Species amaræ.—Equal parts of the leaves of Cirsium mexicanum, Artemisia mexicana, and Erythræa stricta.

Especies aromáticas, Species aromaticæ.—Equal parts of orange flowers and of the leaves of Artemisia mexicana, rosemary, spearmint, sage, origanum and thyme.

Especies diaforéticas, Species diaphoreticæ.—Equal parts of the flowers of red poppy, borage, violet and elder.

Especies emolientes, Species emollientes.—Equal parts of the leaves of mallow and parietaria, and of the flowers of elder and Gnaphalium canescens.

Especies pectorales, Species pectorales. Horehound 5, yerba dulce (see p. 333) 15, Adiantum tenerum 15, liquorice root 10.

Three kinds of extracts of the narcotic herbs are recognized, namely, the inspissated juices, the aqueous made with boiling water, and the alcoholic prepared with alcohol of 60 per cent. The other extracts may be classified according to the menstruum used, as follows:

Cold water: juniper berries, fruit of Crescentia alata, gentian, guaiac wood, opium, rhubarb.

Boiling water: cinchona, Artemisia mexicana, Ambrosia artemisiæfolia, Prosopis dulcis, walnut leaves, senna, Erythræa stricta, Milleria linearifolia, and chamomile.

Alcohol 86 per cent. followed by alcohol 54 per cent.: Fucus vesiculosus.

Alcohol 80 per cent.: physostigma, nux vomica.

Alcohol 60 per cent.: cantharides, cahinca root, ipecac, senega, sarsaparilla, colombo, valerian, squill, agaric, arnica, coca, jaborandi, cannabis indica, rue, savin, saffron, colocynth, poppy capsules, conium fruit, and the seeds of belladonna, colchicum, hyoscyamus and stramonium.

Alcohol 50 per cent.: lactucarium.

Glicerado are mixtures with glycerite of starch: sulphur in the proportion of 1:4, tannin 1:5, potassium iodide 4:30, and narcotic extracts

1:10. A solution is also officinal consisting of potassium iodide 5, iodine 1 and glycerin 40.

The gum resins of ammoniac, asafetida and galbanum are purified by emulsionizing them with about an equal weight of hot water, adding about half their weight of strong alcohol, pressing through rather coarse linen and evaporating by means of a water-bath.

Grajeas are granules, the strength directed being 0·1 Gm. for monobromated camphor, 0·05 Gm. for the valerianates of quinine, iron and zinc; 0·025 Gr. for ammonium valeriauate; 0·01 Gr. for codeine and narcotine; 0·001 for arsenious acid, arseniates, strychnine, morphine and Homolle's digitalin; 0·0b05 Gm. for aconitine, atropine and zinc phosphide; and 0·00025 Gm. for Nativelle's digitalin.

HISTOLOGICAL AND CHEMICAL EXAMINATION OF ANTHEMIS COTULA, LINNÉ.

BY GEORGE EDWARD HURD, PH.G.

From an Inaugural Essay.

After a full botanical description, the histology of the plant is described and illustrated by drawings, mostly microscopical, upon seven plates. In the older stem we usually find about twelve to fourteen wedges separated by rather wide medullary rays. The cambium line is very distinct. The rather thick bark is composed of an external layer of cubical cells, a row of rounded or elongated parenchyma cells, and several rows of incomplete parenchyma containing large quantities of chlorophyll. The bast fibers are comparatively large and are in bundles joined to the wood wedges which are composed of small, round thick-walled pleurenchyma, with numerous scattered ducts. The pith contains intercellular spaces and cells with acicular crystals of oxalate of calcium. Upon longitudinal section we find the ducts near the cambium line to be all spiral ducts, while those in the inner portions of the wood wedges are pitted. The oil glands are found in the disk florets, and also on the stem and leaves of the plant. Those of the florets are found sparingly in the petals usually near the margins, and appear like a globular mass raised above the other tissue; they are of a yellow color which, however, disappears on macerating the florets for some time in alcohol. In the leaves we find oil cells both on the upper side and on the lower surface. Those on the upper

surface are situated at the base of elongated cells, and are imbedded in the epidermal tissue; those on the under surface appear nearly globular, with irregular margins, and are imbedded in the irregular parenchyma tissue among the stomata, and somewhat resemble those found in the florets. Those of the stem are all found in the epidermal layer of the bark at the base of hair cells. The young hair cells are always found with one end attached to the outer tissue of the bark, but in the older cells they are all broken away and are simply fastened by their centre to a row of globular basal cells. These consist of a large, thick-walled oil cell, about two-thirds imbedded in the tissue of the bark, and from three to five smaller cells separated by thin walls; all probably containing oil. A solution of methyl violet was made by dissolving it in ether, after first mixing with a little alcohol, and upon treating the sections with this solution, the color was seen to enter the oil cells through the thin walls of the two upper basal cells, provided the hair was not broken, and then gradually pass downwards into the cells and the large oil cell, as well as upwards into the hair cell. When the hair cell was broken, the color, of course, passed directly into the hair cell and downwards into the others. From this it seems evident that the oil must be volatilized by the plant, through the thin walls of the upper cells.

The plant was analyzed by Wm. H. Warner (A. J. P., 1858, page 388), who found it to contain vol. oil, oxalic, valerianic and tannic acids, coloring matter, acrid fatty matter, bitter extractive, and salts of potassium, calcium, magnesium and iron. Pattone (ibid., 1859, p. 470) announced the discovery of an alkaloid anthemine, and of a crystallizable bitter acid, anthemidic acid (in Anthemis arvensis, *L.*—Editor). Because of the close botanical relation of the plant to Anthemis nobilis its volatile oil was supposed to be analogous, and worthy of examination; through the kindness of Dr. H. W. Jayne, I undertook the work in his laboratory under the supervision of Dr. F. L. Slocum.

Before beginning on the oil, the plant was examined with a view of determining, if possible, the presence of anthemine and anthemidic acid announced by Pattone. Accordingly six kilograms of the fresh plant were exhausted with hot water, and the resulting decoction evaporated to a soft extract. This extract was then digested with alcohol for some time, when about half of it was dissolved. The resulting alcoholic solution with appropriate treatment yielded a small amount of a white crystallizable acid possessing a bitter taste and an

acid reaction, and formed salts with calcium and potassium. The undissolved portion of the extract was then dissolved in water, and with appropriate treatment yielded a very small amount of crystallizable alkaloid, which gave copious precipitates with Mayer's test and bromine water.

Extraction of Oil.—A portion of the fresh flowers was first distilled with about 25 liters of water in successive portions of about 5 kilograms until 30 kilograms of the flowers had been distilled. The oil was entirely dissolved in the water and failed to separate, even after standing in a cool place for several days. It was then extracted with ether, the etherial solution dried thoroughly with chloride of calcium, and the ether distilled off, when a residue of about 4 grams of the oil was obtained. It was of a beautiful green color, which was undoubtedly due to chlorophyll extracted along with the oil. The ether was then recovered from the water used in the first distillation and the water again distilled with more flowers. Successive portions of about 4 kilograms of the fresh flowers were used, and enough water added from time to time to keep the amount at 20 liters. Eleven charges were distilled in this way, and 46 kilograms of the flowers used before any oil made its appearance on the surface of the water, and then only a very minute quantity was observed. The oil was then extracted with ether, as before, and the ether distilled off, when about 6 grams of the oil was obtained. This oil was of a deep straw color or brown. The total amount of oil obtained from 76 kilograms of the flowers was 10 grams, or ·013 per cent., equal to about ·052 per cent. from dried flowers.

A third distillation was also made in the month of August, while the plant was fully in blossom, using the whole fresh plant. This was distilled in successive portions of about 20 kilograms, with about 60 liters of water, until 175 kilograms had been distilled. After the fifth portion had been distilled a very small amount of oil was observed on the surface of the water at each distillation, but not enough so that it could be removed. The whole of the distillate finally had to be extracted with ether as before, and after drying the etherial solution and distilling off the ether, about 17·5 grams of the oil was obtained, or about ·01 per cent. This oil was a trifle more reddish in color than that obtained from the flowers, but proved to be identical with it. The oil seemed to be partially decomposed by continually redistilling the distillate with more of the plant, in the above manner; for the

distillate possessed a disagreeable smell, differing somewhat from that of the oil when pure and dry, and had a decided acid reaction.

The oil thus obtained possessed a strong ethereal odor, somewhat resembling that of the plant, a bitter, acrid taste, an acid reaction and the sp. gr. 0·858 at 26°C. A portion of the oil was distilled alone, when about 30 per cent. came over between 120° and 200°C., about 30 per cent. from 200° to 280°C., the remainder decomposing at this point, leaving about 40 per cent. as a black, tarry residue. A saponification of the oil was then made, using the process adopted by Fittig in his analysis of the oil of Anthemis nobilis ("Annalen der Chemie," 195, p. 79). The oil was first mixed with from fifteen to twenty times its volume of alcohol and saturated alcoholic solution of potassium hydrate added until the solution was alkaline. It was then boiled on a return cooler for about ten hours; the solution was then of a dark brown color and the oil seemed to be entirely decomposed. The alcohol was then distilled off, and the residue dissolved in distilled water. This aqueous solution smelled very much like rose-water and contained a large amount of flocculent matter which would not dissolve even on heating. Water was then distilled off, oily draps coming over with the distillate, more water was added and distilled as long as oily drops came over (distillate *a*). The residue in the flask, consisting of the potassium salt of the acids, was decomposed by adding dilute sulphuric acid (sp. gr. 1.25) until it was slightly acid, a brown, oily substance separating and rising to the surface, where it solidified. More water was then added and distilled off as long as an acid distillate was obtained (distillate *b*). A brown resinous matter remained in flask and would not distil over, probably due to a portion of the oil being decomposed. The acid distillate *b*, was then heated to boiling and an excess of calcium carbonate gradually added; the liquid was well boiled, filtered, concentrated and set aside, when a small amount of fine white crystals were obtained. These were purified by recrystallization and dried, decomposed with very dilute sulphuric acid, the liquid extracted with ether and this evaporated to crystallize. Several decompositions were made both of the oil from the plant as well as that from the flowers, giving similar results. Considerable difficulty was experienced in obtaining the acid in the pure state, as it polymerized easily and a great deal was lost by recrystallizing and decomposing the calcium salt.

Relatively large amounts of the same acid crystallized on exposing

the oil to a temperature of about 10°C. These crystals were drained on a filter, carefully washed with ether, converted into potassium salt and from the solution the adhering oil was extracted with ether. The potassium salt was then decomposed and the free acid extracted with ether and crystallized from its ethereal solution, when it was obtained quite pure. The acid possessed a strong, disagreeable smell, entirely free from any valerianic acid odor, and melted at 58°C. A portion of it was mixed with a large excess of concentrated HBr when it immediately combined and yielded a bromated acid, which upon oxidization with nitric acid yielded hydrobromic acid. The acid was also treated with hydriodic acid and amorphorus phosphorus when the characteristic odor of valerianic acid was produced on heating. The oily distillate *a*, obtained in the decomposition of the oil and probably containing the alcohols, was extracted with ether and yielded, on evaporating off the ether, a light straw colored oily liquid to the amount of about 30 per cent. of the oil used. A portion of this was distilled, when about 40 per cent. came over between 185° and 240°C. and was of a light straw color, while about the same amount came over from 240° to 290°C. and was of a dark brown color. The remainder, about 20 per cent., formed a solid, black, resinous mass. A portion was then treated with about five times its volume of concentrated hydrobromic acid (saturated at 0°C.), but it would not combine. Another portion treated with metallic sodium gave off hydrogen, and united to form a sodium compound which upon treating with water again decomposed into the alcohols and formed caustic soda.

A MUSTARD-SPONGE.—In referring to sponge as a carrier of poultices, Dr. Richardson considers that it makes the best of mustard carriers. The nurse mixes the mustard in a basin with water until the mass is smooth and of even consistency. Then she takes the soft mass all up with a clean sponge, lays the sponge in the centre of a soft white handkerchief, ties up the corners of the handkerchief neatly to form a hold, and applies the smooth convex surface to the skin. This mustard sponge, warmed again by the fire and slightly moistened, can be applied three or four times, is good for several hours, and saves the trouble of making a new poultice for re-application, often a matter of importance during the weariness of night watching. The sponge can afterward easily be washed clean in warm water. It is scarcely necessary to add that this method will save both time and trouble, and that the same sponge may be used frequently.—*Jour. Am. Med. Assoc.*, June 13, 1885.

THEORETICAL OBSERVATIONS ON ANTHEMIS COTULA.

By Dr. F. L. Slocum.

The microscopical examination shows enough oil cells to warrant a much larger yield of oil than was obtained by Mr. Hurd, and that a much larger amount of oil is present is proved by the easy decomposition of the oil, and the polymerization of the acid. The condensation of the acid into resin occurs so easily that in order to make a thorough examination, over four tons of the plant would have to be distilled. The oil even decomposes by distilling the plant as shown by its acid reaction, it undoubtedly being a neutral ether at first. The acid is an unsaturated acid closely allied to angelic and tiglinic acids ($C_5H_8O_2$). It combines with HBr directly to a bromine compound. It decomposes into valerianic acid by gently warming its calcium salt, or heating it with HI and red phosphorus, similar to angelic acid ("Asher, Ber.," 2, p. 685), also by distilling the oil with dilute H_2SO_4 it passes into valerianic acid, as shown by Warner, who supposed the plant really contained valerianic acid, but in reality this acid was only a decomposition product. However, these reactions show that the acid obtained is isomeric with angelic acid.

The alcohols obtained were saturated alcohols, as proven by Mr. Hurd's experiments. Apparently a large portion of them was hexyl-alcohol, $C_6H_{14}O$. The highest boiling portion resembled Fittig's anthemol ("Annalen," vol. 195, p. 104). The alcohols below hexyl-alcohol are present in very minute quantities if present at all. It is much to be regretted that enough of the oil could not be obtained so that definite quantitative results could have been given; but the results as far as ascertained by Mr. Hurd, conclusively prove that the oil of A. Cotula is a compound ether very closely allied to the oil of A. nobilis, hence proving its close family connection and showing it to be a compound ether composed of the same series of acids and alcohols. In fact the compounds of the oils are so nearly identical that the relation of the plants could be identified by an examination of the oils alone.

Prevention of Chrysarobin Staining.—The staining of the clothes caused by chrysarobin may be prevented by making the latter into a dough with water, and after applying to the diseased spot, covering it with a layer of collodion.—*Birmingham Medical Review; Cinc. Lancet.*

GLEANINGS FROM FOREIGN JOURNALS.

By J. Robert Moechel.

Casein Cement.—Mr. Kayser (Mitth. d. Bayer. Gewerb.) recommends this cement as cheap and excellent as to its adhesiveness, especially in cases where gum arabic cannot be replaced by dextrin. Heat milk, precipitate with tartaric acid, collect the precipitate and dissolve while moist in a watery solution of 6 per cent. borax.—*Rundschau, Leitm.*

Cement for China.—Dissolve three parts of freshly precipitated casein in one part of silicate of sodium.

Excellent Mucilage.—To 250 Gm. of a concentrated solution of acacia (2 p. in 5 p. water) add a solution of 2 Gm. of crystallized sulphate of aluminium in 20 Gm. of water. Alum in place of the salt mentioned may be used, but gives less satisfaction. For decolorizing mucilage, freshly precipitated hydrate of aluminium is recommended. The ordinary mucilages, particularly if very concentrated, often fail in their object by merely wetting without causing to adhere, pasteboard to pasteboard, wood to wood, or a metal surface, and without cementing glass, china, pottery, etc. The addition of aluminium sulphate is recommended as sufficient to impart to a concentrated mucilage the desirable adhesiveness. Mucilage intended for pharmaceutical purposes should not be clarified as stated above, since in mixtures a reaction with aluminium may take place.

Pilules Dehaut.—The composition of these pills is said to be equal parts of aloes, scammonium and colocynth. Dorvault gives their composition thus: Aloes, gamboge and extract of dandelion.

Alimentary Solution for Plants.—Potassium nitrate 10 Gm., calcium carbonate 5 Gm., sodium chlorate 5 Gm., calcium phosphate 5 Gm., sodium silicate 5 Gm., ferrous sulphate 15 Gm., to 100 liters of water.

Stain for Ivory.—To impart a brownish tint to ivory, place it in a very dilute solution of nitrate of silver, dry and expose it to the sun; if desired to impart a reddish tint treat a second time with a very dilute solution of auric chloride. Pyrogallic acid is also adapted for the purpose.—*Ph. Ztg.*

Separation of Copper and Cadmium.—M. A. Béhal states that the following easy method may be used for quantitative analysis: If to a solution of a copper and a cadmium salt a strong alkaline solution of sodium tartrate is added no precipitate is formed except a faint tur-

bidity disappearing while shaking. On boiling this solution all the oxide of cadmium is precipitated while the copper is retained in solution. The white $Cd(OH)_2$ which settles rapidly, is collected, washed with a little water and dissolved in NH_4OH, and this ammoniacal solution, treated with ammonium sulphide or H_2S, gives the characteristic yellow precipitate of CdS. Ammoniacal salts prevent precipitation; in this case the solution of the tartrate is rendered strongly alkaline and then boiled, when the ammonia escapes and the precipitate is formed.—*Rép. de Pharm.*, No. 6, 1885.

Quantitative Valuation of Resin in Soap.—The method is based upon the behavior of NaCl to separate out of a solution of soap, only the fat soap, while the resin soap is retained in solution. Dr. Heiner's experiments made with soap containing 20 per cent. of resin, gave on an average $1\frac{1}{2}$ per cent. less of resin. Two samples of equal weight are treated; one is decomposed with H_2SO_4, and the fatty acids containing the resin are weighed. Dissolve the other sample in water, treat with solution of NaCl, separate the liquid containing the resin and glycerin from the soap mass, wash with solution of NaCl, dissolve again in water, precipitate again, wash repeatedly with the salt solution, and decompose the pure soap with H_2SO_4, and weigh. The difference in weight of the two results gives the weight of resin.—*Monit. Scientif.; Centralhalle*, No. 25, 1885.

Detection of cane sugar in sugar of milk.—If a mixture of equal parts of oxalic acid and sugar of milk be warmed over the water-bath, the mass melts and assumes a faintly darker coloration on being heated for some time. In case the mixture contains but one per cent. of cane sugar, it darkens very rapidly, changing from greenish brown to black in the presence of a larger percentage of cane sugar. This method was first proposed by Lorin in "Ph. Zeitsch. f. Russland," xvii, 372, and is recommended as a reliable one in "Phar. Centralh.," No. 22, 1885, p. 244.

Estimation of milk sugar and cane sugar.—The method of A. W. Stokes and R. Bodmer is especially adapted for milk, and requires an ammoniacal Fehling's solution, prepared as follows: Dissolve crystallized sulphate of copper 34·65, Rochelle salt 170, liquor potassæ 170, in sufficient water to make one liter. To 120 cc. of this solution add 400 cc. ammonia (spec. grav. 0·880), and dilute to one liter. This ammoniated cupric fluid constitutes the *Pavy solution*, of which 10 cc. correspond to 0·005 Gm. of glucose; it is advisable to standardize it

with inverted cane sugar. The saccharine liquid or the sufficiently diluted milk is first titrated in the ordinary way. Then another portion of the milk is boiled with two per cent. of citric acid during ten minutes—which operation inverts all the cane sugar—the liquid when cool may be tritrated. The first result gives sugar of milk alone, the second also the inverted cane sugar, and thus the percentage of both sugars is easily calculated.—*Analyst*, April, 1885, p. 62.

Neutral Salicylate of Atropine is said to be a more valuable salt than the sulphate, and superior to the latter. Its preparation is not difficult, but the exact neutralization is very important. The necessary proportions are: Atropine 2·30 Gm., salicylic acid 1·08 Gm., and sufficient alcohol, but exact neutralization should be insured by testing with delicate test-paper. Dissolve the atropine in the alcohol by means of a gentle heat, add slowly in minimal quantities the salicylic acid until absolutely neutralized, and filter if necessary. Evaporate carefully over a steam or water-bath to a syrupy consistence, and dry at a very gentle heat. The powder is hygroscopic, and the watery solution (as most of the alkaloids) very unstable on account of the formation of a species of algae (*Leptomitus Higrocrocis*).—*Progresso*, March; *Ph. Ztg.*, No. 41, 1885.

Remedy for Warts.—Among other remedies, carbonate of magnesium has been recommended, especially in cases where the warts are very numerous; a teaspoonful of it is to be taken three times a day for two or three weeks, and is said to effect a sure cure. The warts may also be touched with crystallized carbolic acid, of which a small crystal is placed on the wart and allowed to be absorbed. In addition to this treatment carbonate of magnesium is recommended to be taken internally.—*Ph. Ztg.*, No. 38, 1885,

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WHOOPING COUGH MIXTURE.—Dr. A. Platt has found the following mixture to answer an excellent purpose:

℞	Copaibæ.....	
	Balsam. Tolut.....	
	Pulv. Acaciæ.....	aa ℥ ss
	Aquæ.....	℥ iv
	Acid. sulphuric. aromat.....	gutt xx

Mix the acacia with the balsams and gradually add the acidulated water. Dose, a teaspoonful when required, three, four, or five times a day.—*New Eng. Med. Monthly*, April, 1885.

MATERIA MEDICA OF THE NEW MEXICAN PHARMACOPŒIA.

By the Editor.

(Continued from p. 343.)

Banderilla, Lœselia cærulea, *Cavanilles;* nat. ord. Polemoniaceæ. The plant grows near Guadalupe, Pachuca, etc., and is commonly employed as a diaphoretic, emetic and cathartic.

Barbas de chivo, Clematis sericea, *De Cand.*, Ranunculaceæ; in the mountains of Pachuca. The bruised leaves applied to the skin for a few minutes are rubefacient, and by longer contact produce blisters and superficial ulceration; the dried leaves are destitute of these properties.

Bellota, the fruit of Mexican oaks, is used as an astringent. Dose, 12 to 15 Gm. of the powder; the decoction 15 to 30 Gm. to one liter of water.

Berros. Under this name several plants are used for their antiscorbutic and diuretic properties, namely, Nasturtium officinale, *De Cand.*, Nast. amphibium, *De Cand.*, Sium angustifolium, *Lin.* (also known as berra or berraza), and Tropæolum majus, *Lin.* (also known as mastuerzo).

Betabel. The leaves of the cultivated Beta vulgaris, *Lin.*, are laxative and emollient.

Betónica. In Mexico, Betonica Alopecurus, *Lin.*, is somewhat employed as a stimulant, sialagogue and sternutatory.

Boconia, Bocconia frutescens, *Lin.*, Papaveraceæ; in Michoacan and other hot districts. The milkjuice, in doses of 12 to 24 drops, is used as a purgative and anthelmintic, and, mixed with water, as an application for ulcerated eyelids; the boiled and bruised leaves as vulnerary cataplasms. The extract may be used for dyeing, the colors being handsome and lasting. An analysis appears not to have been made; the milkjuice being of a yellow color, it probably contains the same or similar constituents as celandine.

Boldo, Boldoa fragrans, *Jussieu;* Monimiaceæ; from Chili. Used in affections of the liver and kidneys.

Bolontibi, Cissus acida, *Lin.*, Vitaceæ; in Yucatan. The acidulous and mucilaginous leaves, bruised, are employed in itch, tinea and other cutaneous affections; also as a maturative.

Borraja, Borago officinalis, *Lin.*, naturalized in fields in Mexico. The leaves and flowers are occasionally used as a stimulant and sudorific.

Brea, the residue from the distillation of turpentine. Two kinds are distinguished in Mexican commerce: 1. Brea de Penca; congealed in moulds of maguey leaves, it forms elongated planoconvex cakes, yellow, glass-like, transparent and brittle. 2. Brea de Marqueta; in cubical cakes or broken, more or less opaque, blackish brown, somewhat empyreumatic.

Butua, Cissampelos Pareira, *Lamarck*, Menispermaceæ, near Chilpancingo, in the State of Guerrero, etc. The root is fibrous, hard, externally brown, internally yellowish gray, the cross section showing concentric, easily separable layers; inodorous; taste sweet, afterwards bitter; reputed to possess diuretic properties. The juice of the leaves is used against snake bites.

Cabalonga (the seeds of Strychnos Ignatii, *Bergius*), Cacao, Café, Cálamo aromatico (calamus), Canela (cinnamon), Cardamomo menor (cardamom), Cascarilla, Cástóreo (castor), Catecú, Cebada (barley) Cebolla (onion), Cera de abejas (beeswax), Cicuta mayor (Conium maculatum), Cidra (Citrus medica), Ciruelo de España (prunes), Clavo de especia (cloves), Coca de Levante (cocculus indicus), Coca del Perú (coca leaves), Cochinilla (cochineal), Cola de pescado (isinglass, in Mexico also obtained from Silurus Bagre and other fishes), Cólchico (tuber and seeds), Colombo, Coloquintida (colocynth), Comino (cumin), Cubeba, Cuernecillo de centeno (ergot), Cuerno de ciervo (hartshorn, from Cervus mexicanus, etc.), Culantro (coriander), Cúrcuma, Cuso. These drugs, well known in our commerce, have been admitted.

Cacahuate, Arachis hypogæa, *Lin.;* Leguminosæ. The seeds are used as an aliment and for preparing the fixed oil; the root is commonly used as a substitute for liquorice root.

Cacaloxochitl, Plumiera rubra, *Lin.*, Apocynaceæ; in Morelos, Yucatan and other hot districts. The flowers are pectoral; the juice is used for certain ulcers and for destroying warts.

Cacomite, Tigridia pavonia, *Persoon;* Iridaceæ; in Central Mexico. The bulb is rich in starch, and is boiled and used for food; among common people it enjoys the reputation of being febrifuge.

Cainca, Chiococca anguifuga, *Martius;* Rubiaceæ; Brazil, etc. The Mexican cainca is Ch. racemosa, *Jacquin*, which, with other roots, is known in Brazil as puaia (poaya), and in Cuba as bejuco de verraco.

It is emetic and purgative; dose, 0·5 to 2·0 Gm., the extract 0·3 to 1·0 Gm.

Calabaza, Cucurbita maxima, *Duchesne*, and C. Pepo, *Lin.* The flowers and fruit are alimentary; the seeds, particularly those from the hot districts are tænifuge in the dose of 60 Gm.

Calaguala is the name given to the rhizomes of different species of ferns, principally Polypodium aureum, *Lin.*, having diaphoretic and pectoral properties, and used in decoction and powder; dose, 2 to 4 Gm.

Calancapatle, Solidago montana, *Flor. Mex. ined.;* the powder as a vulnerary in atonic ulcers; the decoction in lotions. Similar uses are made of Doronicum glutinosum, *Willd.*, and Grindelia glutinosa, *Dunal*, known as Calancapatle de Puebla.

Camote, Batatas edulis, *Choisy;* Convolvulaceæ. The leaves are used for fodder, the roots as food, and the starch as a substitute for arrowroot. The tubers of Oncus esculentus, *Loureiro*, Dioscoreaceæ, are known as Camote the cerro, and on account of the large quantity of starch are used for food.

Canchalagua, Erythræa stricta, *Schiede*, E. chilensis, *Persoon*, E. jorullensis, *Kunth;* Gentianaceæ. Stem slender; leaves oblong-linear, rather obtuse; inflorescence in dichotomous pannicles; corolla-lobes 4 or 5, elliptic-oblong; stigma cleft; capsule two-celled. Among other constituents Lebœuf (1868) found 9 per cent. of bitter principle. The flowering tops are used as a bitter tonic and stomachic; dose, 15 to 30 Gm. in 500 Gm. infusion.

Cántaridas. A number of Mexican beetles are employed as substitutes for cantharides, of which the following are the most important:

Triodons Barranci, *Duges*, M. tridentata, *Lin.* The male is 18 mm. long and 7 mm. broad; the female 44 mm. long and 10 mm. broad; color black; jaws prominent, on the inside with three strong teeth; antennæ moderate, the second joint very short, the eleventh elongated and thin at the extremity; thorax small, narrower than the elytra and head; wing cases covering the greater portion of the abdomen of the male, and scarcely the second abdominal ring of the female; abdomen voluminous, soft; legs long and stout; claws yellowish, bifid. The insect is collected from June to September.

Cantharis eucera, *Chev.* Length 30 to 18 mm., width 9 to 4 mm.; head black, the upper half red; antennæ black, moniliform in the female, the fourth to sixth joints trigonal and somewhat dilated; tho-

rax a little broader than and about half the length of the narrow, smooth and glossy black wing cases; abdomen black, in the male the upper part red from the second to the last but one segment, and near the centre with five black dots; lives on pumpkin and other cucurbitaceæ.

Mendoza and Herrera proved these insects to contain cantharidin and other constituents of Spanish flies. The indigenous species of Triodons and Meloe were found to be more active than those of the genus Cantharis. For description, etc., see "Gaceta Médica," 1866, vol. ii, and "La Naturaleza," vol. i.

Cañafístula, Cassia fistuloides, *Flor. Mex. ined.* The fruit is 20 to 60 cm. long, indehiscent, has two longitudinal bands, and its chambers are filled with a black saccharine pulp, containing yellowish flat rhomboidal seeds. 100 parts of fruit yield 445·52 parts of pulp. The fruit of Cassia brasiliana is also met with in the Mexican commerce.

Cáñamo. The fruit of Cannabis sativa, *Lin.*, is used in the form of an emulsion in inflammations.

Cañuela or Cola de caballo, Equisetum arvense, *Lin.;* used as a diuretic and antiblennorrhagic.

Caoba, Swietenia Mahogoni, *Lin.;* Cedrelaceæ. The bark is antiperiodic and astringent; dose 2 Gm.

Capitaneja, Bidens (Platypteris, *Kunth;* Verbesina, *De C.*) crocata, *Cavanilles;* Compositæ. In the valley of Mexica, southwest of the capital. Stem stout, four-winged, villous; leaves opposite, villous, the lower ones halbert-shaped, the upper ones pinnatifid and dentate; flowers terminal and axillary, long-peduncled, with the involucre globose, the tubular florets reddish yellow, and the akenes oblong, compressed, two-awned and membranous on the margin. Instead of this plant Helianthus alatus, *Flor. Mex. ined.*, is sometimes collected, which has alternate and dentate leaves, a terminal inflorescence and yellow flowers. The decoction is used as a wash for venereal ulcers, together with the powdered leaves; also for curing the sores of beasts of burden.

Capulin, Cerasus Capollin, *De Cand.;* grows in temperate regions of Mexico. The fruit is edible; the distilled water of the leaves is a substitute for cherry laurel water; the bark is antidysenteric and antiperiodic; dose 1 to 2 Gm.

Caraña, Amyris Caranna, *Humboldt,* Terebinthaceæ. In the hot

districts of Mexico the tree yields a resin which is externally dark gray, internally dark brown, when heated of a balsamic odor, of a bitter resinous taste, completely soluble in alcohol; it is only used in plasters.

ANALYSIS OF THE LEAVES OF ILEX CASSINE.

By F. P. Venable, Ph. D.

The Yopon (*Ilex Cassine*, Linn.), is described in Hale's "Woods and Timbers of North Carolina," as an elegant shrub ten to fifteen feet high, but sometimes rising into a small tree twenty to twenty-five feet. It has, according to the same authority, for its *habitat* the strip of country from Virginia southward along the coast, never extending, however, very far into the interior. The leaves are one half to one inch long, with a smooth surface, and fine serrated edge. The plant is an evergreen, and its dark green leaves and bright red berries make it attractive as an ornamental shrub. In the region of the Dismal Swamp, and in other sections the leaves are annually gathered, dried, and used for tea. This decoction is, according to Hale, oppressively sudorific, at least to those unaccustomed to its use. The famous "Black Drink" of the Southern Indians was made from the leaves of this shrub. "At a certain time of the year they come down in droves from a distance of some hundred miles, to the coast for the leaves of this tree. They make a fire on the ground and putting a great kettle of water on it, they throw in a large quantity of these leaves, and seating themselves around the fire, from a bowl that holds about a pint, they begin drinking large draughts, which in a short time occasions them to vomit freely and easily. Thus they continue for the space of two or three days, until they have sufficiently cleansed themselves, and then every one taking a bundle of the leaves, they all retire to their habitations." Having on hand a small sample of these leaves procured from New Berne during the winter of 1883, it seemed desirable to make an examination of them to decide, if possible, the presence of any alkaloid or other principle which would make the decoction useful as a beverage. The usual treatment with magnesium oxide, exhaustion with water, separation by means of chloroform and subsequent purification, was adhered to, resulting in obtaining a small amount of a white substance slightly soluble in water, more so in alcohol, and

easily soluble in chloroform, which gave distinctly the tests for caffeine, especially the murexide reaction, and very closely resembled a specimen of pure caffeine from Powers & Weightman.

This caffeine formed ·32 per cent. of the dried leaves. Later on, in May, a much larger supply of the same leaves was gotten from the neighborhood of Wilmington. A more thorough examination of them was then made with the following results:

Water in air-dried sample	13·19
Extracted by water	26·55
Tannin	7·39
Caffeine	·27
Nitrogen (on combustion)	·73
Ash	5·75

The analysis of the ash is shown in column I.

	I.	II.
CaO	10·99	12·34
MgO	16·59	11·39
Na_2O	·47	7·28
K_2O	27·02	2·98
MnO_2	1·73	2·50
Fe_2O_3	·26	3·41
SO_3	2·50	·92
Cl	·66	·71
P_2O_5	3·34	5·54
SiO_2	1·32	44·75

The Maté or Brazilian Holly (*Ilex Paraguayensis*), belongs to the same genus. Its ash analysis, as made by Senor Arate, is given in column II. The plant grows wild in Brazil and is very largely used by the South Americans. It has, according to Peckolt ("Phar. Jour. Trans." [3], 14, 121–124, "Am. Jour. Phar.," 1883, p. 570), been planted, and seems to succeed well, in the Cape of Good Hope, Spain and Portugal. It is stated that six different species of ilex are used in the preparation of this tea. Peckolt gives, in his analysis of the air-dried leaves, the percentage of caffeine as ·639. The average percentage of analyses, by different authors, is about 1·3. I can find mention of only one other ilex used as a substitute for tea. The analysis of this by Ryland and Brown is quoted in Blythe's "Composition and Analysis of Foods," p. 343. It is called the Ilex Cassiva, is said to be used as a tea in Virginia, and the percentage of caffeine is given as ·12. This is probably the same thing as the Yopon, the analysis of which is given above, and the "cassiva" may be a misprint for "cassine."—(See Analysis by Henry M. Smith, in *Am. Jour. Phar.*, 1872, p. 216.)

THE ESTIMATION OF MORPHINE IN OPIUM.

By J. Howard Wainwright, Ph. B.

As one of the chemists connected with the United States Laboratory at the port of New York, my attention has been in a large measure directed to the assaying of opium, samples of which, from every case entered here, are sent to this laboratory for the estimation of morphine.

The literature upon this subject is very voluminous, probably more so than that relating to the assay of any other drug, and comprises the descriptions of many methods.

The requirements of a method adapted to the work of this laboratory are, rapidity of manipulation, simplicity of the apparatus and, most important of all, accuracy of results. I have, therefore, undertaken an investigation of this very interesting subject, the purpose of which has been, not to test all of the methods published, but simply to try some of the most general and to compare them in order to find one, or the essential features of one, which best meets the above demands.

There are not many different varieties of opium imported at this port, by far the largest amount being Smyrna or Turkish, occasionally some Persian, and very rarely small amounts of Egyptian and Indian—these latter usually in sample lots. The total number of samples assayed during the year ending December 30, 1884, was four hundred and one, the percentage of morphine being generally between 9 and 15, some few samples of Persian opium yielding as high as 18 per cent. and two or three samples of Smyrna yielding less than 9 per cent. As the law prohibits the importation of the drug showing less than this proportion of morphine, such cases as the latter are rare. Assays are made upon samples as they are received from the official drug examiner. When the percentage is over 15 per cent. or under 9, duplicate determinations are invariably made.

The sampling of opium for the morphiometric assay is a matter of great importance, especially when the drug is in the moist commercial condition.

The best method, and the one usually employed for sampling a case, is described by Dr. Squibb in his *Ephemeris*, Vol. i, No. 1, as follows: "About every tenth lump of a case should be sampled by cutting out a cone-shaped piece from the middle of the lump with an ordinary pocket knife. Then, from the side of each cone, a small strip is taken

from point to base, not exceeding half a gram from cones which would average 10 to 15 grams, and the cone is then returned to its place in the lump. The little strips are then worked into a homogeneous mass by the fingers, and the mass is wrapped in tin foil, moist cloth or paper to prevent drying, until it can be weighed off for assay." This sample obtained from the case should not be less than 100 grams, and should be sampled down to the convenient weight to be taken for assay. This is quite important, as I have found that the morphine contained in pieces taken from different parts of the same sample lump frequently varies as much as 1 or more per cent. Also, whilst some opiums may be "worked into a homogeneous mass by the fingers," as above, in others this will be found very difficult, if not impossible, as they may be either too moist and sticky or too hard and dry. I am, therefore, in the habit of sampling the large sample lumps in one of three ways, according to the condition of the drug. If quite moist the ball is flattened out and small portions are taken from every part on the end of a penknife until the required weight is obtained; or, whenever possible, a thin section is cut through the middle of the ball, and from this the sample is taken from around the edges and from the centre, and when the opium is hard and dry, or where great accuracy is required, the ball is broken up in a mortar as finely as possible, weighed and dried, the moisture being determined from the loss in weight. It is then powdered and thoroughly mixed, and the proper quantity weighed off.

The method of assay formerly in use here is, perhaps, the most simple, being little more than a rough estimation of morphine, yielding results which are at best only approximate, and not in any way to be relied upon where great accuracy is required. However, as it is extremely simple, and, with a little practice, easy of manipulation, it may be worthy of a brief description. Ten grams of the sample are weighed off into a porcelain mortar and allowed to macerate about twelve hours or over night with 50 cc. of hot water. It is then thoroughly mixed with the pestle and the mass transferred to a linen or flannel filter of convenient size with as little hot water as possible. The filtrate is allowed to run into a flask, accurately marked at 100 cc., and when all that will has run through the filter and contents are squeezed between the fingers until most of the extract is expressed; it is then moistened with a little hot water and again expressed as above. This moistening and expressing is repeated until exactly 100 cc. of

extract and washings are obtained. If the extract comes through cloudy, which is sometimes the case, it will have to be refiltered through paper. The paper is then washed, and the extract, then more than 100 cc., must be concentrated to that volume or exactly one half taken. If the extract in the flask is exactly 100 cc., as it should be, it is well shaken to insure thorough mixture and allowed to stand and settle for about one hour; 50 cc., representing 5 grams, are drawn off with a pipette and transferred to a small beaker, a very slight excess of a solution of equal parts of ammonia and alcohol is added, and the liquid well stirred and allowed to stand over night, when the impure morphine will crystallize out. These crystals (which it will often be found necessary to detach from the sides of the beaker with a small steel spatula) are collected upon a tared filter and washed with a little cold water, applied drop by drop around the edges of the filter, until it runs through almost colorless. The filter and contents are now dried at a temperature not exceeding 100° C., and washed with about 25 cc. of ether to remove the narcotine, again dried and then weighed. From repeated experiments 85 per cent. of this weight was found to represent approximately the weight of the morphine.

The only advantages of this method are its extreme simplicity and economy of time. It was originally adopted because of the very great number of samples which then required daily examination. In ordinary cases its disadvantages, however, were found to be many. It is only applicable to a moist opium, as this is the only one which will yield an extract running clear through the linen or flannel filter. It is also difficult to extract the opium completely in this manner with 100 cc. of water; at least double that amount is required. This increased volume, however, would involve the necessity of concentrating the liquid, which, otherwise, would be too dilute, and thus time would be lost. The precipitated morphine (it can hardly be called crystallized) is always very impure and dark colored and requires a great deal too much water to wash it, and always carries with it a large proportion of narcotine which the ether will not remove unless a large quantity is used, and then only imperfectly; the precipitate usually forming large, hard lumps. It is also difficult to remove all the precipitate from the sides of the beaker, which, however, would make no difference if the beaker were tared. The time occupied by this method is ordinarily about forty-eight hours, and not more than five, or at most eight samples can be conveniently run at the same time. Having used this

method for upwards of six months and finding it not at all satisfactory, as something more than a rough assay was desired, I concluded to try some of the various methods published and compare the results obtained.

The method which I have been using for some time past and which leaves little to be desired is essentially that published in the *Ephemeris*, by Dr. Squibb, whose kind permission I have to describe it briefly, with a few comments which may not be amiss.

I have compared this method with the official one of the Pharmacopœia and also with others, upon a specially prepared sample of opium made up from selected specimens which were dried, powdered and thoroughly mixed. In four different parts of this sample the morphine was determined by Dr. Squibb's method and the average of the results obtained was taken as the percentage of morphine.

The following is a brief description of this method of assay, as used in my own practice. It consists of three distinct operations, viz.: 1st. The preparation of the extract. 2d. Separating the morphine therefrom; and 3d. The treatment of the separated alkaloid.

1st. A convenient weight of the sample (preferably about 10 grams) is introduced into an ordinary salt mouth vial of about 4 to 6 ounces capacity, fitted with a good cork. About 100 cc. of *boiling* water is added, and the bottle is tightly corked and allowed to stand, after frequent hard shaking, for from twelve to twenty-four hours. The magma is allowed to settle, and the dark extract is decanted upon a filter of convenient size. When most of this extract has run through into a medium size beaker, from 30 to 50 cc. of boiling water is added, the bottle is well agitated, and the contents are then transferred to the filter with as little hot water as possible. When all the liquid has drained through the filter it is carefully washed down with a very little hot water, applied drop by drop around the edges, and allowed to drain as much as it will. As soon as the liquid ceases to drop, the beaker is replaced by an evaporating dish of about 100 to 150 cc. capacity, and the contents of the filter are brought back into the bottle by means of a small spatula, and again shaken up with about 50 cc. of hot water. They are then thrown upon the same filter and are washed completely upon the filter from the bottle, this washing being continued until about 100 cc. have run through into the dish, or until the washings come through colorless. The dish is now placed upon a water-bath and the weak extract evaporated, adding to it from time to time the stronger portion from the beaker, until the whole is concentrated to a volume

of about 20 to 25 cc. The concentrated extract is transferred with as little water as possible, to a 2 ounce Erlenmyer flask, accurately tared and provided with a tight-fitting cork, and allowed to cool. It is now ready to be submitted to the second part of the process, viz., the separation of the morphine.

2d. After adding 10 cc. of 95 per cent. alcohol, the flask is agitated, and a volume of ether equal to that of the contents is added, the cork is tightly fitted and the flask well shaken. The cork is now removed, and, before the ether has had time to separate, a slight excess (about 4 cc.) of a 10 per cent. solution of ammonia is added. The cork is again replaced and the flask well shaken until crystals of morphine begin to separate. The flask is now set aside in a cool place and the separation of the alkaloid allowed to continue for about twelve hours, when it will be complete. This complete separation may also be accomplished in from half an hour to two or three hours by continuous or frequent agitation.

The alcohol is added in order to permit of the ether mixing readily with the aqueous extract, and thereby prevent the separation of narcotine which is readily soluble in this menstruum.

3d. When the separation of morphine is complete the cork is removed from the flask and the upper stratum of ethereal fluid carrying most of the narcotine, etc., is carefully decanted through a tared filter of 9 centimeters diameter, without disturbing the dark, watery liquid in the bottom of the flask. Upon this dark liquid is now poured about 20 cc. more ether, which is rinsed around the sides of the flask and the surface of the liquid, and is decanted carefully through the filter as before, that remaining being absorbed by means of a strip of blotting paper. The filter is washed down with a little more ether, applied drop by drop around the edges and allowed to dry so that the heavy liquid which is now thrown upon it, together with the morphine, will pass through readily. The crystals remaining in the flask are then washed upon the filter with cold water and the washing continued until the water comes through colorless.

The filter and contents are removed from the funnel, and the edges, having been carefully folded together, are pressed between folds of blotting paper until most of the moisture is absorbed. It is then dried in an air-bath (together with the tared flask, if any of the crystals remain adhering to its sides) at a temperature of 100° C., and weighed, the result obtained, after subtracting the tare of the filter (and flask, if

it has been found necessary to dry and weigh it), will be the weight of morphine in the sample taken.

Dr. Squibb directs that 1 gram of these crystals, finely powdered, should be weighed off and treated in a large test tube fitted with a cork, with 10 cc. of officinal lime water; upon occasional shaking, the whole should dissolve, thereby showing the absence of narcotine.

He also says that the filter should be tared both before and after weighing the crystals. This, I think, hardly necessary, as the coloring matter and gumming substances can be washed quite free from the paper and crystals without danger of loss of morphine if the water used is quite cold. I have tried this repeatedly, and find that 50 cc. of water used in washing will not make any great difference in the weight of the morphine.

It is also my experience that the use of *hot* water in making the extract seems to work much better than cold; the final results of the assay, if carefully conducted, being about the same in either case, but the opium can be completely extracted with much less water in the former case, the resulting liquid filters much more readily, and the magma is much easier to wash.

I hope to continue this subject in a future paper, describing some results with other methods upon the sample already referred to.—*Jour. Am. Chem. Soc.*, February, 1885, p. 45–57.

DETECTION OF STRYCHNINE AND OTHER ALKALOIDS IN CASES OF POISONING.

By T. Chandelon.

The usual mode of isolating strychnine in poison cases is that of Stas: the following process is recommended as more convenient and very accurate. The intestines, etc., are cut up very finely, mixed with an equal weight of well-burned gypsum, and the whole well rubbed in a mortar until a perfectly homogeneous mass results. This sets in 4 to 5 hours, when it is easily broken up into fragments. These are dried either in a water- or air-bath at 70°, pulverized, and the powder boiled with 90 per cent. alcohol to which some tartaric acid is added. When the powder has been boiled for an hour in a large flask connected with a reflux condenser, it is filtered, and the residue washed with hot alcohol. If the reaction of the filtrate is not acid enough,

tartaric acid is added and the whole distilled. When the bulk of the alcohol is distilled off, the remainder is expelled by evaporation to dryness on the water-bath, the residue is taken up with a little boiling water, and left to cool in order to separate the fat. The filtrate, which should be about 20 to 25 cc., is made decidedly alkaline with soda and transferred to a large watch-glass, mixed with gypsum, allowed to set, powdered, dried in an exsiccator, and then extracted with chloroform in a large Soxhlet's apparatus. The chloroform extract is brought to a small volume, 10 to 15 cc., filtered if necessary, and the extract treated with an equal volume of a saturated solution of oxalic acid in ether. Fine acicular crystals of strychnine oxalate soon appear; the oxalate is collected on a filter, washed with a mixture of equal parts of alcohol and chloroform, dried and dissolved in the least possible quantity of water, and the strychnine precipitated by addition of ammonia.

By this method, the author has recovered strychnine from a frog killed by a subcutaneous injection of 0·01 gram, from the liver of a rabbit killed by subcutaneous injection of 0·04 gram of the sulphate, and from the stomach of a cat killed by eating flesh containing 0·03 gram of strychnine.

Experiments show the process to be very accurate. As chloroform is a solvent of most vegetable alkaloids, it is evident that this process or a slight modification of it can be used for the isolation of such of them as are precipitated by an ethereal solution of oxalic acid. The author made experiments with brucine, narceine, papaverine, thebaine, morphine, aconitine, atropine, hyoscyamine, veratrine, nicotine, conine, and colchicine, two of these, morphine and colchicine, were not soluble in chloroform, the others were completely precipitated as oxalates. The precipitate took some hours to form in the case of strychnine, brucine, narceine, codeine, nicotine, and conine, for the remainder 24 hours were necessary. The precipitate was crystalline in every case except that of aconitine, which was amorphous.

In the case of brucine, nicotine, veratrine, and atropine, which are not completely precipitated by ammonia, the oxalate is dissolved in alcohol, the oxalic acid is precipitated by a little alcoholic potash, filtered off, and the potash removed by a stream of carbonic anhydride; after frequent filtration, the alcohol is allowed to evaporate spontaneously, and the pure alkaloid remains.—*Jour. Chem. Soc.*, May, 1885, p. 605; from *Zeit. Physiol. Chem.*, [9], 40–48.

PREPARATION OF NITROUS OXIDE.

By P. Cazeneuve.

The explosions which sometimes take place in the preparation of this gas on the large scale, are explained by the fact that the decomposition of ammonium nitrate is an exothermic reaction, and that the large quantity of heat thus liberated added to that directly applied, is capable of causing the sudden decomposition of the whole mass of the salt. The process is often slow in beginning on account of the contained moisture, and hence the operator is apt to apply undue heat at first. Therefore, the salt should previously be dried in a capsule at a temperature below 200°, and the retort should be heated slowly until the disengagement of gas begins, when only a very gentle heat will be required, and the operation should not be pushed too far towards the end. That the recently prepared gas has an irritating odor and causes symptoms of asphyxia, whilst after standing for some days in the gasholder it becomes easier to breathe, is due to the well-known difficulty of completely removing small quantities of one absorbable gas from another, even when the absorbing solution is very energetic in its action. The author found that nitrous oxide even after slow passage through solutions of ferrous sulphate and of sodium hydrate, retained this irritating odor, which he traced to the presence of a little hyponitrous acid. But when the gas was several times shaken up in a test-tube with a solution of ferrous sulphate, the irritating odor was at once removed, and the same effect was produced by allowing it to remain 24 hours in the gasholder. The author recommends that the gas should in all cases be prepared a sufficient time beforehand. The diminution in the anæsthetic properties of the gas after remaining for a time in the gasholder, is due to the fact that the nitrous oxide always contains a little free oxygen and free nitrogen, and that during a prolonged stay in the gasholder, the water gradually absorbs the protoxide; the relative proportions of oxygen and of nitrogen are thereby so increased that the anæsthetic property of the gas is sensibly diminished.

The author has examined the liquefied nitrogen protoxide, prepared in Paris by Duflos, and in London by Barth, and sold in cast-iron bottles. He finds these products are chemically pure, and therefore their employment in dental practice offers great advantages.—*Jour. Chem. Soc.*, May, 1885, p. 613; from *J. Pharm.*, [5], XI, 67–73.

DETECTION OF NITROUS AND NITRIC ACIDS.

By R. Warington.

In the present communication the author gives the results of experiments on the various tests for nitrous and nitric acid. The delicacy of a test depends greatly on the manner in which it is applied, therefore old as well as new tests are included in the present note. In nearly all cases blank experiments were made under exactly similar conditions to those of the test experiment.

Detection of Nitrous Acid. Iodide Test.—1 cc. of Trommsdorff's reagent is added to 5 cc. of nitrite solution, and the mixture acidulated with one drop of dilute sulphuric acid (1 in 5); under these conditions a solution containing 1 part of nitrous nitrogen per million of water soon caused an abundant liberation of iodine, whilst 1 in 20 millions gave rise to a blue coloration in 3 minutes, and solutions containing 1 in 100, and 1 in 200 millions, gave a blue tinge in 30 and 60 minutes respectively. The blank experiment only began to color in 4 hours. The *metaphenylenediamine test* is accelerated by warming. Four drops of a solution containing 5 grams per litre, and one drop of dilute sulphuric acid added to 5 cc. of nitrite solution, causes a speedy and very distinct reaction with one part of nitrous nitrogen per million of water, but with 1 in 10 millions the change begins in 2 minutes, and the final color is only pale straw-yellow. *Paramidobenzene-azo-diamethylaniline test* (Meldona, Trans., 1884, 108).—A solution containing 0·16 gram of this reagent per litre is employed, and one drop of test solution, one drop of dilute sulphuric acid, and finally a slight excess of ammonia, are added to 5 cc. of nitrite solution. No reaction is obtained with solutions containing 1 part nitrous nitrogen per million of water, when the reagents are added immediately after one another, but when the solution acidified with sulphuric acid is heated for 2 minutes in boiling water, then on addition of the ammonia a distinct blue coloration is obtained even with 1 part of nitrous nitrogen in 10 millions of water, and a pale sap-green with 1 in 100 millions. The color is somewhat fugitive. With the *naphthylamine test*, using one drop of saturated solution of sulphanilic acid, one drop of dilute hydrochloric acid, and one drop of saturated solution of naphthylamine hydrochloride, as already stated (Trans., 1881, 229), 1 part of nitrous nitrogen in 100 millions

gives a reaction in six minutes, 1 in 500 millions in an hour or two, whilst even 1 in 1,000 million can be detected.

Detection of Nitrous and Nitric Acids.—The four following tests give a reaction with both nitrous and nitric acid, but the reaction of the first mentioned is the only one which is characteristic for these substances, inasmuch as the other three give the same reaction with all oxidizing agents. The *ferrous sulphate test* is equally sensitive with both nitrous and nitric nitrogen, and is conducted most effectually in the following manner. Place 1 cc. of nitrite or nitrate solution into a tube, and pour down 2 cc. of concentrated sulphuric acid so as to form a lower layer, mix suddenly and run in immediately 3 cc. of a cold saturated ferrous sulphate solution, which forms an upper layer. In this way, with solutions containing 1 part of nitrous or nitric nitrogen in 100,000 parts of water, the colored band appears at once, with 1 in 200,000 there is a faint reaction in 1 or 2 minutes, whilst with 1 in 300,000 the reaction is very slight. *Indigo test* (according to Boussingault).—The concentrated substance is boiled with a few drops of indigo, and successive quantities of strong pure hydrochloric acid, the disappearance or discoloring of the indigo is the indication of oxidation. One division of Boussingault's weakest indigo = 0·00077 milligram of nitric nitrogen. This test does not answer in the presence of many organic substances. *Brucine test.*—To get a distinct pink color, 5 cc. of concentrated sulphuric acid are added gradually to a cooled mixture of 2 cc. of the liquid and one drop of brucine sulphate. One part of nitric nitrogen in 10 millions of water soon gives a reaction, whilst 1 in 20 millions causes a faint tinge after some time. With nitrous nitrogen, 1 part in 1 million of water gives a full pink, but 1 in 10 millions produces scarcely any reaction. *Diphenylamine test.*—The reaction is assisted by heat, by adding a large excess of sulphuric acid, also by the presence of chlorides, but only when the volume of sulphuric acid is not greater than that of the liquid taken. The color is fairly permanent, and increases on standing. With 2 cc. of liquid, two drops of diphenylamine solution and 5 cc. concentrated sulphuric acid, 1 part of nitric nitrogen in 1 million of water produces a deep blue at once, 1 in 10 millions a pale blue after a few minutes, whilst 1 in 20 millions gives no distinct blue. (Trans., 1884, 644, it is stated that solutions of this strength do give reaction; it has, however, since been observed that the reactions obtained in those experiments were due to an added impurity.) Nitrites act in a similar manner, but more

rapidly. One millionth part of a gram of nitric nitrogen can be detected by this test when using 1 cc. of liquid.

Detection of Nitric Acid in the Presence of Nitrous Acid.—There is no satisfactory method for effecting this when the quantity of nitric acid is very small, for nitric acid is either produced, as in the second and third, or only vaguely indicated, as in the first of the following methods. 1st. Estimate the total nitrous and nitric nitrogen as ammonia or nitric oxide; and then the nitrous nitrogen with permanganate, or with phenylenediamine, the difference between the two estimations, is due to nitric nitrogen. 2d. Piccini recommends destroying nitrites by boiling acidified solutions with carbamide, and then testing for nitric acid. 3d. Muir suggests conversion into ammonium salts, and evaporating to dryness to destroy nitrite.—*Jour. Chem. Soc.*, May, 1885, p. 593; from *Chem. News*, [51], 39–41.

ON THE EXAMINATION OF BUTTER.

By Morton Liebschütz.

Although it does not seem a matter of much importance, in the abstract, whether the fatty body used as food is derived from the fatty deposits of the animal, or from the emulsion called milk, the chemist is often compelled to decide whether a given sample is genuine butter or an imitation.

Dalican has given a method based on the percentage of *insoluble* fatty acids. He asserts that, as a nearly general rule, pure butter yields 86·5 per cent. of fatty acids, while oleomargarine shows only 93·75 per cent. His method, which is excellent when time permits, and only a few samples are to be tested, is too tedious for general use. The washing of the fatty acids of pure butter requires at least two days, it being considered complete only when the water used for the operation remains perfectly neutral.

The determination of the glycerin would be, I think, a shorter way of examination, and David's method of saponification by barium hydrate might be used with advantage. David proposed the method for the so-called titration of tallow, his plan being to extract the glycerin from a large sample of fat (100 grams), to bring the glycerin to a known volume, and to take its specific gravity. Knowing the per-

centage of glycerin contained in solutions of determined specific gravity, he calculated the yield in glycerin from the fat treated. This method has not, so far as the author is aware, been adopted, and it is doubtful if it will be. First of all, the glycerin obtained is impure, containing compound salts of glycerin and baryta. For this reason the results are liable to vary with the different fatty bodies; the glycerin of each different fat will contain proportions of saline matters different from the glycerin yielded by the fat taken as a type, the solutions of which have been regarded as containing the standard amount of glycerin. Although we know that the *volumetric* determination of glycerin, or more properly the hydrometric determination, cannot be used, the process of saponification may be applied with advantage to the examination of butter. We shall describe the method as it might be used for butter analysis. David's paper will be found in "Comptes Rendus," 1882.

The sample of butter, so called, is first melted in the air-bath at 70°C. The clear fat rising above the water, salt and other impurities, is decanted through a small dry filter, placed in a warm funnel, and the filtrate is collected in a small dish. About 20 grams are taken, allowed to cool, and weighed, together with a small spatula. 10 grams are removed and placed in a porcelain capsule of about 500 cc., heated on a steam or water bath, and when the fat is very warm 20 grams of barium hydrate (9 mols. water) are added. When the emulsion has formed, pour in 30 cc. of hot alcohol, at 90°C., stirring briskly until the mass is nearly dry.

Add 200 cc. of cold water; break the mass of barium soap with the spatula, and boil to reduce the liquid to one-half. Cool for a time, decant through a linen filter, repeating the boiling and the decantation three times at least; then, finally, throw the whole contents of the capsule upon the filter, after dividing the soap finely with a small pestle. Wash the filter with a few cc. of water, and squeeze it with the fingers. Evaporate all of the solutions to about 100 cc.; add litmus and neutralize cautiously with dilute sulphuric acid. Neutralize the slight excess of acid with barium carbonate Filter the solution, wash the filter, and evaporate the liquor to a syrupy consistency.

As has already been said, the glycerin so obtained is not pure. Treat the contents of the capsule with strong alcohol; a large quantity of salts is thrown down. The alcoholic solution is filtered through a small filter, previously moistened with alcohol, and the filtrate is col-

lected in a tared platinum or porcelain dish. Evaporate the alcohol on the water-bath and dry in the air-bath above 100°C. to constant weight. After noting this, heat the glycerin, and burn it. The weight of the ash is deducted from the total weight; the differenc is glycerin. The percentage of ash compared with the total percentage of glycerin is by itself an important factor, as glycerin derived by this mode of treatment from pure butter gives 5 per cent. of ash, whereas the glycerin of oleomargarine and other similar fats leaves only from 0·3 to 0·6 per cent.

By this method I have found, after deduction of said ash, 3·75 per cent. glycerin in pure butter; 7 per cent. glycerin in oleomargarine.—*Jour. Amer. Chem. Soc.*, May, 1885, p. 135.

GLEANINGS IN MATERIA MEDICA.

BY THE EDITOR.

Trehala which is used as food in Syria, has been investigated by Guibourt (1858), Berthelot and Hanbury. It is a cocoon formed upon a species of Echinops by a beetle which has been named Larinus nidificans, *Guibourt*, L. subrugosus, *Chevrolat*, and L. maculatus, *Faldermann*. The same substance has now been further examined by Dr. G. Apping (Thesis, Dorpat, 1885). His chemical analysis yielded moisture 10·78, ash 2·79, fat and chlorophyll 0·16, trehalose 23·84, tannin and citric acid traces; albuminoids soluble in water 8·09, soluble in soda 1·88, and insoluble in both liquids 2·31; cellulose like substance derived from starch 24·90; true starch 6·72; mucilage soluble in water 7·60, and mucilage insoluble in water 10·93. The most important constituents, trehalose, starch and mucilage, were fully examined, and inquiries were made into the origin of trehala. The cocoon is a product of the larva, but the material for this structure, although of vegetable origin, cannot have been derived from the plant, upon which it was built, since Apping found the pith and other portions of the tissue of the stems to be entirely free from starch and from trehalose, while the granules detected in portions gnawed by the larva were observed to be outside of the cell walls; these microscopic observations were verified by Professor Russow.

Maize and oil of maize. Maize or Indian corn is a valuable article of food, containing about 10 per cent. of nitrogenous principles and 7 per cent., or in some varieties 9·5 per cent. of fat. The presence of

the latter interferes with many of the uses for which corn is otherwise adapted, but the ripe fruit cannot be deprived of the oil by pressure. After the grain has been malted, the light germ may be separated by careful crushing and winnowing, and yields by pressure about 15 per cent. of oil, and a press cake, rich in albuminoids and retaining 4 or 5 per cent. of oil. In the manufacture of starch the ground mixture of corn and water, on standing, deposits the starch and leaves a milky liquid, which readily undergoes putrefaction. This liquid is an emulsion of oil of maize in the dissolved albuminoids, and may be utilized for the production of both substances. The separation may be accomplished according to a patent granted March 10, 1885, to Dr. F. V. Greene, by precipitation by heat or by diluted mineral acids or various salts, notably by aluminum sulphate. According to the manipulation the oil may be recovered by filtration, by pressure or by a solvent, the remaining albuminoids being valuable for manure or for other purposes.

Oil of maize has been used to some extent as a lubricator and for soap-making. It is of a yellowish or bright yellow color, bland, rather thick, has the specific gravity 0·92 and at—10° C. (14° F.) congeals to a white mass. The oil is colored transiently dark green by sulphuric acid, and orange red by nitric acid, and by nitrous acid it is converted into a somewhat soft yellow mass.

Aloin. Dr. Justus Dietrich (Thesis, Dorpat, 1885) has studied the detection of aloin in animal secretions and excretions, and found the following reactions serviceable for this purpose:

HNO_3+KCy.—The residue left on evaporating the alcoholic solution was dissolved in a few drops of nitric acid, the solution evaporated by means of a steam bath, dissolved in alcohol, and the deep red solution treated with a drop of alcoholic solution of potassium cyanide, which produced a rose-color with five different aloins.

In the following tests the aloin residues were dissolved in a little water:

Chloride of gold produced with barbaloin a raspberry red color (still recognizable with 0·00006 aloin) after some time changing to violet. Socaloin and cape-aloin gave a rather faint color, rapidly changing to violet; nataloin red-violet, rapidly turning to violet; Curaçao-aloin bright red.

Bromated potassium bromide gave a distinct turbidity with the aloins of Barbadoes, Socotra and Curaçao; none with Port Natal or Cape-aloin.

Tannin gave a turbidity only with barbaloin, probably due to a decomposition product.

For the detection of aloin the fæces were digested with water acidulated with sulphuric acid, then macerated for 12 hours with three volumes of strong alcohol, the filtrate concentrated, and the residue successively agitated with petroleum benzin and amylic alcohol; on evaporating the latter aloin was left. The treatment of blood and urine was similar. From his results the author concludes that on taking aloes or aloin, the greater portion is excreted with the fæces; a small portion only is absorbed and passes mostly through the kidneys while the remainder enters the liver and with the bile is conveyed back into the intestines.

Products of Xanthorrhœa. Baron Ferd. von Mueller (Zeitschr. Oesterr. Apoth. Ver. 1885, 293) gives an account of the geographical distribution in Australia and Tasmania of the different species of this genus and of their resinous products, which of late years have been extensively exported by Messrs. William Somerville and Henry Wilks who prefer the resin of X. hastilis, X. quadrangulata and X. Tateana for various reasons; X. Preissii yields one of the best resins, and is widely distributed in Western Australia. The resin of X. hastilis is known as gum acroides, is yellow and lighter colored than the other kinds, usually more sticky, and less inclined to become pulverulent; it is rather fragrant, but less so than the resin of X. quadrangulata. A comestible gum somewhat resembling tragacanth is sometimes deposited in the trunk in vertical concentric layers. 300 tons of the resins of X. hastilis have been exported in one year, and at one time the price rose to £65 per ton for the best quality, but for ordinary quality is from £7–10. One trunk yields on an average 5 pounds of resin which exudes from the persistent rudiments of the leaf bases, the exudation being sometimes increased by bush fires.

The resin of X. Tateana is dark reddish-brown, like the resin of X. australis, but dryer; a trunk yields about 20 pounds, and during the collection of the resin is destroyed; the value is about £25 per ton.

The author has sometimes seen masses of resin weighing 50 pounds at the base of the trunk of X. australis, most probably the produce of several years melted together by repeated fires. X. semiplana is stemless and produces little resin. X. minor is matted, the tufts of leaves being approximate and radical. In wet soil X. Preissii remains stemless.

The resin of X. quadrangulata is dark, glossy and of an agreeable odor resembling that of honey and benzoin; on exposure it becomes somewhat powdery, but is also found as small globular masses at the base of the trunk. X. arborea has the persistent bases of the leaves of previous years very short, and the resin is rather difficult to collect; the yield a of trunk is about 3 pounds, and the resin is almost ruby colored.

NATURAL CAMPHOR OILS.

By Peter Macewan,

Secretary in Scotland to the Pharmaceutical Society.

Natural camphor oils, namely, those of *Dryobalanops aromatica* and *Camphora officinarum*, have long been esteemed as remedial agents in the countries where they are produced, and their introduction in this country is considered by some a mere question of time.

The Dryobalanops, or Bornean camphor oil, is a more simple body than laurel camphor oil, consisting chiefly of borneene, an isomer of turpentine oil, with a small quantity of resinous matter. Its specific gravity is close upon 0·900. Johore oil, which I have previously referred to, has a specific gravity of 0·882. Other samples (for which I am indebted to Mr. Jackson, Curator of the Kew Museum) are somewhat higher, one (*a*) being 0·894, and another (*b*) 0·909: *a* is De Vriese's specimen and *b* Mr. Motley's; both are over thirty years old. Specific gravity is the point in which the Bornean oil differs chiefly from laurel camphor oil, the former being much lighter. The Bornean oil in its natural condition, and even when old, does not contain its peculiar camphor in solution; hence it undergoes no change when exposed to a low temperature, which is another point of difference between it and the laurel camphor oil; so, also, is it different from the fact that it acquires a green color, similar to cajuput oil, when kept in contact with metallic copper for a day or two.[1]

The Bornean oil does not appear to enter the British drug market, unless (probably) as an adulterant of cajuput oil.

The camphor oil of Formosa was the only lauraceous kind with

[1] The intensity of the color varies; it was least with Johore oil and greatest with Mr. Motley's. Laurel camphor oil becomes brown or greenish-brown.

which we in this country were familiar until lately. Mr. Holmes has favored me with a portion of specimen (451 e, Catalogue of the Pharmaceutical Society's Museum) which came from Formosa, per ship *Nestor*. This has a specific gravity of 0·943, and becomes gelatinous, from separation of camphor, when frozen. The color of this oil is golden yellow. If a drop of it be rubbed on the back of the hand a strong camphor odor is first felt, and when the camphor dissipates, a sassafras odor remains. The oil quickly dries upon the skin and leaves no mark. This oil may be taken as a saturated oleaceous solution of camphor. No satisfactory chemical examination of it has yet been made, the results of earlier chemists, such as Martius and Pelouze, being somewhat conflicting and indefinite.

Japanese camphor oil appears to have been brought to this country only recently. A specimen was presented to the Pharmaceutical Society towards the end of last year. Mr. Braithwaite, in a paper communicated to the London Chemists' Assistants' Association, says of it: "It is the essential oil obtained as a bye-product in preparation of camphor from *Laurus camphora* (*sic*). It consists of a saturated solution of camphor in one or more hydrocarbons of the terpene group. . . . The odor is peculiar, resembling a mixture of camphor and sassafras. It is remarkable that the crude oil from Japan smells much more strongly of this oil than that from Formosa."[1]

The specific gravity of this oil is 0·951, somewhat greater, therefore, than that of the Formosa oil, yet it is a thinner oil. The color is similar. The odor of camphor is feeble, indeed, if one could disassociate from it the idea of camphor, I question if it could be perceived; but the sassafras odor is very powerful. The feeble camphor odor is explained in what follows, and is due to the absence of camphor, for there is no separation of camphor when the oil is chilled, as we would expect were it, like the Formosa oil, a saturated solution of camphor or crude oil, as Mr. Braithwaite states. The specific gravity of the oil is almost the same as that of crude oil, yet when camphor is removed from crude oil it becomes lighter. In the "Chemical News" for December 12, 1884, there is an interesting paper by Mr. H. Oishi, which throws some light on the apparent anomaly. This paper contains an account of the method followed in Japan for the sublimation of camphor from the wood, and also that for the separation of camphor from the crude oil, which was devised three years ago. Briefly stated,

[1] "Chemist and Druggist," 1885, p. 20.

the method is simply distillation, the distillate being collected and surrounded with cold water. "Camphor separates out as a semi-solid mass, and, in order to separate the solid camphor from the oil, the liquid is filtered or squeezed out through a cloth bag." By a second distillation more camphor is obtained.

Assuming (owing to high specific gravity) the specimen under notice to be crude oil and that chilling without previous distillation does not effect separation of camphor, I roughly distilled a small quantity so as to simulate the Japanese method. Very little came over below 150° C., about a twelfth between that and 170°, a fifth between 175° and 185°, and nearly the same up to 205°. None of these yielded camphor when chilled. So far, distillation had gone on for an hour, and yet there was not a crystal of camphor about the condenser, nor did the residue yield any when chilled. The experiment conclusively proves the absence of camphor.

According to Mr. Oishi, the purified oil has a specific gravity of 0·895, the crude 0·959. My specimen is 0·951, yet it is the purified article. Mr. Oishi's experiments explain this. His results show that the purified oil is composed to the extent of nearly three-fourths of bodies boiling above 170° C., and these are heavier than the more volatile bodies, the heaviest being 0·926. The oil which I have examined gives little or no distillate below 140° C., some between that and 150° C., and nearly one half of the whole requires a temperature up to 205° to vaporize it, and the residue has a specific gravity of 0·995. The inference is apparent.

So, therefore, the camphor oil of Japan has the camphor removed from it before it is sent to this country, and in this condition it is (according to Mr. Oishi) "a complicated mixture consisting of hydrocarbons of the terpene series, oxyhydrocarbon isomeric with camphor, and other oxidized hydrocarbons." The camphor isomer distilled between 180° and 185° C., and constituted from 10 to 12 per cent. of the whole. It is a liquid.

I find that the Japanese oil differs from the Formosa oil in its behavior towards nitric acid. If half a drachm of B.P. acid be allowed to act upon a few drops of the Japanese oil for a minute, then diluted with half a drachm of water, a crimson color is imparted to the clear watery solution; but the Formosa oil so treated gives a milky solution having a scarcely perceptible green shade. Hydrochloric acid acquires a salmon color with both; more marked, however, with Japanese oil.

The camphor-free oil is used in Japan chiefly as an illuminant by the lower classes, also for the preparation of carbon for "Chinese Ink," and Mr. Oishi indicates a use for it as a constituent of varnishes.[1] It is questionable, however, if it can be called an efficient substitute for the popular camphorated oil of this country, and I cannot conceive how it is destined to replace it. The crude oil might possibly be a valuable addition to our materia medica, but I am afraid that its sassafras odor would prevent the public taking it up.

From the United States we hear that large quantities of this oil are being received there, and that it is being used for adulterating oil of wintergreen. There should be no difficulty in detecting the adulteration, for oil of wintergreen has a specific gravity of 1·180, which the addition of camphor oil will lower. A rough and ready test (perhaps as good as any) is to gently agitate a few drops of the oil in water; if it be pure it wholly subsides in a few seconds, but if it contains camphor oil several minutes elapse before it subsides, and time is given to notice that the particles of oil assume different forms other than globular.

The action of nitric acid may also be noted; it has little effect upon pure oil, but adulterated oil becomes red.—*Phar. Jour. and Trans.*, June 20, p. 1045.

The Tests for Bile in Urine have been critically examined by Carl Deubner (Thesis, Dorpat, 1884), who obtained the best results with the methods proposed by Hilger and by Rosenbach. According to Hilger ("Archiv d. Phar., vol. 206, p. 385) the urine is moderately heated and rendered alkaline by barium hydrate; a small portion of the washed precipitate treated carefully with a few drops of concentrated nitric acid gives the well-known color reactions, green, violet, blue.

Rosenbach ("Chem. Centralblatt," 1876, p. 150) recommends filtering the urine through white filter paper; this acquires a yellow or brown color, which with a drop of nitric acid changes to yellowish red, the margin of the spot becoming violet and deep blue, while towards the centre the color gradually changes to emerald green. The modification of this test recommended by Deubner consists in placing a few drops of the urine upon a porous plate of white clay, when the spot remaining will show the reaction plainly and for some time. The advantage of this modification is that very little of the material is sufficient for applying the test, and that errors arising from the decomposition of the paper by the acid are excluded.

[1] When the oil is rubbed on the skin a resinous coating remains on drying. This is rather objectionable than otherwise.

BAROS CAMPHOR—"KAPUR BAROOS" OF JOHORE.

By Peter Macewan.

This camphor is "found native," and since an early date has been sought after by the inhabitants of the Malayan Archipelago. Though not surprising to learn that it is obtained in Johore, the Forestry Exhibition specimens appear to be the first brought to this country. I have failed to find any information in books regarding the extent to which *Dryobalanops aromatica* exists in Johore, and the amount of camphor obtained therefrom. Mr. Jamie says:

It is only within the past few years that Johore was known to contain camphor trees, similar to those in Borneo, growing amongst many other valuable kinds of timber. As it may not be generally known, I may mention that in the protected State of Perak a vast forest of camphor trees has been found and this is conserved by the Government."

Mr. Meldrum writes: "The Kayo Kapur yields the gum known as Borneo camphor or 'Kapur baroos.' It is the natural production of the tree and from its scarcity and the virtues attributed to it by the Chinese, *fetches more than its weight in silver. It all goes to China.* The timber of the camphor tree is as durable and as strong as teak. It weighs 48 lbs. per cubic foot. It is a handsome tree, frequently running up to 150 feet with a diameter of 6 or 7 feet at 5 feet from the ground."

Two very interesting papers on "Borneo Camphor" are contained in the twelfth volume of the "Pharmaceutical Journal," one by Dr. W. H. de Vriesse, the other by Sir W. J. Hooker. In these and the classic account given by the authors of "Pharmacographia," full information regarding the method of collection will be found. The amount annually obtained varies considerably. Thus the Labuan export in 1863 was valued at 5,168 dollars; in 1864, 11,156 dollars; and in 1881 it had fallen to 2,587 dollars. There is a duty of from 5 to 10 per cent. on this as on all natural products.

The Maharajah's collection contained four qualities of the camphor, a specimen of the oil, and a good section of the tree showing the camphor *in situ.* Of the latter, Professor Archer was exceedingly proud. In Hooker's paper, the illustration given of a specimen received from Labuan represents a condition of things quite different from the Johore specimen. In the former, the crystals (which are of the rectangular prism form) are situated in and around furrows in the wood, but in the latter the wood is only roughened, not furrowed, and the camphor is deposited in scales. Where the cleft occurs in the wood the surface is of a brown color, and has a varnished appearance (due to deposit of resin), the crystals adhering to it. Otherwise, the wood is exactly the color of cinnamon.

I have said that the camphor is in four qualities. This is noteworthy, for in "Pharmacographia" it is stated that it is picked, cleaned and selected into *three qualities;* Mr. Jamie also states in the subjoined note, that it is unusual to find four qualities. For these reasons, I give details.

First quality.—Transparent crystals, unmixed with woody matter and destitute of color. Few of the crystals are less than a sixth of an inch

across; generally a quarter of an inch and upwards. Three picked crystals gave the following measurements and weights: 1. 16·25 × 11·5 mm. and 25 centigrams; 2. 15 × 12 mm. and 36 centigrams; 3. 13 × 10·25 mm. and 27 centigrams.

Second quality.—Crystals inferior in size to the above, and they are mostly of a brown color. There is a considerable proportion of small crystals approaching the pulverulent condition. Two picked crystals gave the following measurements and weights: 1. 12 × 10 mm. and 16 centigrams; 2. 9 × 5 mm. and 8 centigrams. In addition to brown coloring matter there is free woody tissue, etc., the residue obtained after washing with rectified spirit amounting to 2·8 per cent.

Third quality.—This is made up of powdery crystals, coherent and slightly colored greyish. It contains very little insoluble matter, the residue obtained from 2 grams being unweighable. In appearance it resembles crude Japanese camphor. May this specimen be the result of sublimation!

Fourth quality.—Brownish and pulverulent; not unlike seashore sand. Not so coherent as the third quality. It contains 2·3 per cent. of insoluble matter.

I asked Mr. Jamie if he had ever met with four qualities in Singapore, and gave him a description of these, to which he replies: "The four qualities of camphor you allude to, unless specially marked as coming from Borneo, are surely the product of the Johore camphor tree. How there can be *four qualities* from the one tree is more than I can satisfactorily explain. Both natives and Chinese pick out the large and clear crystals from the smaller and colored ones in order to obtain a better price. As this camphor is highly esteemed by the Chinese and natives, the practice of picking would be resorted to, as well as that of adulterating with Japanese and Chinese (Formosa) camphor, which is readily procured in the native bazaars. [The appearance of the third quality as suggesting admixture with laurel camphor is here alluded to.—P. M.] It is very well known that few classes of people are such adepts at adulterating as the Chinese are, and this may account for the similarity of appearance. The Bornean camphor is all in the hands of the Chinese and native traders, and the Johore camphor will be also. The stock of either kind is very limited, and commands absurdly high prices. In Borneo I paid 5 dollars per ounce for a genuine specimen of the camphor, which I presented to the Museum of the North British Branch of the Pharmaceutical Society. Compare it with the Johore samples."

Mr. Jamie's specimen is like what a mixture of the four Johore qalities would be. It contains some very fine crystals, free from color, but also colored and powdery crystals. Another sample sent home by Mr. Jamie consists of a mixture of crystals and wood.

In "Pharmacographia" it is stated that Borneo camphor does not crystallize on the interior of the bottle in which it is kept. This is not correct. The bottle containing Mr. Jamie's genuine sample has a well marked deposit, and in the bottles containing the Johore specimens deposits have commenced, particularly in the third quality. I observe a *very large deposit* in an old specimen in the Edinburgh Museum of Science and Art.

This specimen is kept in the top gallery, where the temperature is frequently high.

There is nothing remarkable about the camphor oil, it is similar in appearance to laurel camphor oil which has lately been introduced here. Its specific gravity is 0·882. Mr. Jamie says of it, "Every camphor tree yields a large quantity of oil which is very much used externally for rheumatism by all classes, *and is often used as an adulterant of cajeput oil*, being considerably cheaper than it. The camphor oil might be used instead of the Pharmacopœia lin. camphoræ. I have seen it frequently prescribed in place of it.

I beg to express my indebtedness and thanks to Mr. Jamie for his valuable information. – *Phar. Jour. and Trans., March* 28, 1885, pp. 795–796.

NOTE.—In a note to "Phar. Jour. and Trans.," May 2, 1885, Mr. J. R. Jackson states that two samples of Baros camphor in the Kew Museum corresponding to the third quality, as classified by Mr. MacEwan, have deposited crystals; one of these samples was sent from Borneo by the late Mr. Motley in 1851, the other from Sumatra by Dr. de Vriesse in 1855. The superior kinds, whiter and larger crystals, received at the same time, show no deposit whatever. The specimens are not subjected to any very high temperature.

A sample of Baros camphor corresponding to the first quality described above has been in our possession for about twenty years, and was presented to us by the late Prof. Procter, who, we believe, received it from the late Daniel Hanbury. The bottle is kept in a closet, where during the summer the temperature may reach occasionally 95 or 100° F.; during the first ten or twelve years no sublimate was observed, but since that a moderate amount of crystals has formed in the upper part of the bottle.—EDITOR AMER. JOUR. PHAR.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

A Treatise on Practical Chemistry and Qualitative Inorganic Analysis, adapted for use in the laboratories of colleges and schools. By Frank Clowes, D. Sc., Lond., etc. With illustrations. From the fourth English edition. Philadelphia: Lea Brothers & Co., 1885. 12mo, pp. 376.

We may simply repeat the favorable opinion which we expressed after the examination of a previous edition of this work (see "Am. Jour. Phar.," 1881, p. 143). It is practical in its aims and accurate and concise in its statements. Slight changes in the arrangement were very judiciously made. Thus the first section now treats of the preparation and use of apparatus, which are necessary in performing the experiments with certain gases and liquids, described in section II; the use of the spectroscope has been tranferred from the appendix to the analytical operations in section III, etc. Among the new matter added in the present edition, may be mentioned in section VI the reactions of various organic matters, such as alcohol, starch, glucose, urea, albumen, six of the most important alkaloids, and nine organic acids; the latter, we think, would be more conveniently considered with tartaric and other organic acids in section IV, and the number might be increased by cinnamic and malic acids, which are frequently met with.

But these transpositions and additions do not represent the only or main changes in the present edition; of far greater importance is the care which

has evidently been bestowed upon the book, so as to keep it abreast of modern science, and to render it still more useful as a guide to the beginner in chemical analysis.

Commercial Organic Analysis. A treatise on the properties, proximate analytical examination and modes of assaying the various organic chemicals and products employed in the arts, manufactures and medicine; with concise methods for the detection and determination of their impurities, adulterations and products of decomposition. By Alfred H. Allen, F. I. C., F. C. S., etc. Second edition, revised and enlarged. Vol. I. Introduction, alcohols, neutral alcoholic derivatives, sugars, starch and its isomers, vegetable acids, etc. Philadelphia: P. Blakiston, Son & Co., 1885. 8vo, Pp. 476. Price $4.50.

On the appearance of the first edition this work was received as a most valuable one, and the extent to which it has been used as a guide for determining the commercial purity of organic substances has shown it to be practical and reliable; for it contained not only the results and observations of the author's extended experience, with analytical processes, but the literature on the subject matter had been carefully scrutinized and adapted to the plan of the work. In these respects the second edition now before us is fully equal to the preceding one, and will doubtless prove to be an equally trustworthy guide, embodying pretty much all the information known on the subject up to the time of placing the work in the printer's hands.

A rearrangement of the material has been found desirable, and the increased scope and numerous necessary additions will enlarge the work to three volumes, instead of two as heretofore. The first volume is now before us, and its contents are as above indicated. The introductory portion treats of the various operations and apparatus for the examination and analysis of organic bodies. The alcohols considered are methyl, ethyl and amyl-alcohol, and alcoholic beverages and liquids. The alcoholic derivatives embrace the ethers, aldehydes, chloral and chloroform. About 130 pages are devoted to the various kinds of sugar, 60 pages to vegetable fibres, starch, dextrin and gums, and the remaining 90 pages to the commercial organic acids and their salts. The processes by which these articles are prepared, are briefly given, then their properties, followed by the means for identification and tests of purity, the information on these latter topics being quite exhaustive.

The remaining volumes which are promised to follow in rapid succession, will contain the following subjects: Vol. II. Fixed oils and fats, tannins, hydrocarbons, phenols and their allies and derivatives, coloring matters, etc. Volume III. Cyanogen compounds, alkaloids and organic bases, albuminoids, etc.

List of Tests (Reagents) arranged in alphabetical order according to the names of the originators. Designed especially for the convenient reference of chemists, pharmacists and scientists. By Hans M. Wilder. New York: P. W. Bedford, 1885. 12mo, pp. 88. Price $1.

We are greatly pleased to observe that the little pamphlet which we noticed on page 56 of this volume has been speedily followed by a more ex-

tended list, prepared by Mr. Wilder with his noted care. The list enumerates 870 tests, which are in most cases briefly described, sufficiently so for application; in those cases requiring lengthy details, references are given to American or English publications, where these details may be found. A full index by subjects enhances the usefulness of the little work, which is of particular value to the readers of chemical literature in which reference to such tests is frequently made. We have carefully examined a large number of the quotations and found the statements to be correct. The author of the nitroprusside of copper tests for volatile oils is G. S. Heppe, who recommended it in 1855 for the detection of adulterations of oxygenated oils with oil of turpentine and similar hydrocarbons, these adulterations preventing the color reactions of the oxygenated oils with the reagent; the statement under No. 334, while essentially correct, we think should be modified by adding the behavior of oil of turpentine.

An Outline of a Course of Study in Practical Pharmacy. By Oscar Oldberg, Phar. D., Professor of the theory and practice of pharmacy, and director of the pharmaceutical laboratory of the Chicago College of Pharmacy. Published by the author, 1885. 12 mo, pp. 104.

This little work covers the ground pretty thoroughly, giving the skeleton of an extended course in practical pharmacy, in which nothing seems to have been omitted, that may tend to familiarize the student with his work; but on the contrary he is frequently led to study the same subject from different views, as may be seen, for instance, from the tables giving a classification of drugs according to their constituents, or from the enumeration of preparations made by various processes. The contents of the work may be briefly summarized as follows: Introductory portion, relating to legislation, education, pharmacopœias and metrology; manipulations; inorganic chemistry; organic chemistry; organic drugs and their constituents; pharmaceutical preparations; extemporaneous pharmacy and finally laboratory work. The book is almost entirely suggestive, the more important points relating to each subject being merely indicated, so as to show the student the direction which his studies should take. For those who do not attend lectures, the author has indicated in the preface the order in which the experimental illustrations may be combined with a course of studying from books.

Proceedings of the California Pharmaceutical Society and College of Pharmacy for the years 1883 and 1884; also Proceedings of the Alumni Association. San Francisco: 1885. 8vo, pp. 133.

This contains a number of papers and abstracts of theses, to the more important of which we shall refer in another place.

Twenty-first Annual Report of the Alumni Association, with the exercises of the 64th Commencement of the Philadelphia College of Pharmacy, for the year 1884–85. 8vo, pp. 188.

The frontispiece consists of a well-executed phototype of Edward C. Jones, who was one of the projectors of the Alumni Association, has served as its treasurer for 17 years, and has always been untiring in efforts to promote its usefulness. As usual, the volume contains the minutes of meetings, and the various addresses and lectures delivered during the past year.

Proceedings of the Connecticut Pharmaceutical Association at the ninth Annual meeting held in Hartford February 3 and 4, 1885. Also the constitution, by-laws and roll of members. 8vo, pp. 87.

A brief account of the meeting was published on page 360 of our July number.

Sanitary suggestions on How to disinfect our Homes. A resumé of the latest and best information on the household use of disinfectants, deodorants and antiseptics, and of practical precautions preventive of cholera, diphtheria, scarlet fever and other infectious diseases. Prepared for popular perusal by B. W. Palmer, A.M., M.D. Detroit: George S. Davis, 1885. Pp. 58. Price 25 cents.

A timely publication, which deserves to be widely known and read.

Hay Fever and its successful treatment by superficial organic alteration of the nasal mucous membrane. By Charles E. Sajous, M.D., etc. Philadelphia: F. A. Davis, Att'y., 1885. 12mo, pp. 103.

This essay was read before the Philadelphia Laryngological Society in April and discusses the causes of hay fever and its treatment, the latter consisting, in order to effect a permanent cure, in cauterizing by means of galvano-cautery or acids the hyperæsthetic portions of the nasal mucous membrane. The little book is well written and handsomely printed, and contains 13 good wood cuts, illustrating the various instruments and the operations.

Second Report of the State Board of Health of the State of Tennessee. October, 1880 to December, 1884. Published by Authority. Nashville: 1885. 8vo, p. 600.

Contains numerous official reports on sanitary subjects.

The physiological and medicinal action of fluoric acid and the fluorides. By L. A. Waddell, M.B., Surgeon I.M.S., etc. Calcutta. Pp. 112.

A reprint from the "Indian Medical Gazette," 1883. The hydrofluoric acid experimented with was ¼ per cent. solution, the dose of which is 10 minims to 2 drachms, vomiting being excited by ½ ounce. The alkaline fluorides are more advantageously used than the acid, in doses of ¼ grain to 3 grains, emesis resulting from doses of 6 grains and upwards. These salts are incompatible with the salts of calcium, lead and other metals; they should be diluted and given after food to relieve the nauseating after effects. Extract of liquorice was found to be the best corrective of taste. Solutions of ammonium fluoride should be kept in glass bottles coated with wax on the inside.

Practical Results from the Study of the preservation of Alimentary Substances. By Filippo Artimini. Florence, 1885. 4vo, pp. 24.

The author claims having discovered a process for the preservation of carcases of animals in the fresh state without the use of ice; the material used is not mentioned. The pamphlet is printed in two languages, Italian and English.

Friedrich Wöhler. By Prof. F. B. Power. Pp. 14.

A well written biography, reprinted from the "Western Druggist," May, 1885.

International Electrical Exhibition, 1884. General report of the Chairman of the Committee on Exhibitions.

Report of Examiners of Sections V, VI and VIII (Electric lamps; carbons for arc lamps.)

Report of Examiners of Section X (Steam boilers.)

These three reports are illustrated. The Franklin Institute of Philadelphia, under whose auspices the Electrical Exhibition was held, has made arrangements for a Novelties Exhibition to be held in Philadelphia, from September 15 to October 31, 1885.

VARIETIES.

TROCHES OF HÆMOGLOBIN.—Benczur ("Dtsch. Med.-Ztg.") reports upon the hæmoglobin treatment as carried on in von Ziemssen's clinic. Troches were prepared from ox-blood. The daily amount of hæmoglobin given was about twenty-five grains. Not only was there a marked improvement in the cases of anæmia thus treated, but no gastric disturbance was observed, such as follows the administration of large doses of iron.—*N. Y. Med. Jour.*, May 30, 1885.

PILLS OF OIL OF THYME.—The "Bulletin général de thérapeutique" gives the following for rheumatism:

Volatile oil of thyme	10 grains;
Soap	10 "
Powdered althæa	q. s.

Divide into six pills. Two to be taken before each meal.

DIARRHŒA MIXTURE.—Dr. E. X. Veat, of Portland, Maine, has used the following formula in his practice, with most excellent results:

℞	Extracti hæmatoxyli	ʒiv
	Tinct. opii camph	℥j
	Tinct. zingiberis.	
	Tinct. rhei comp. aa	ʒ ss

M. Dose, a teaspoonful every two or three hours.—*New Eng. Med. Monthly*, May, 1885.

ANTI-RHEUMATIC MIXTURE.—Dr. H. K. Lines has obtained good results with the following:

℞	Vini colchici sem.	℥ ss
	Tincturæ gentian. comp.	℥ iiss
	Potass. iodid.	ʒ ij

Mix. Sig. Teaspoonful three times a day in a wine glassful of water.—*New Eng. Med. Monthly*, May, 1885.